

AUSTRALIAN HYMENOPTERA CHALCIDOIDEA—II

The Family Mymaridæ with Description of New Species.*

BY A. A. GIRAULT.

INTRODUCTION.

I PRESENT herewith the second part of the Australian Hymenoptera Chalcidoidea, dealing with that family of excessively minute insects, the MYMARIDÆ. No new genera have been found thus far in Australia. All the previously known forms have been captured excepting one or two, and thirty-six new species are described, together with several new varieties. The paper is restricted solely to the systematic results but it should be stated that most of the collections in the group were made along the east coast of Queensland only and it is very probable, therefore, that a rather large number of forms remain as yet unknown, especially from the western coast of Australia and from the interior. For the present, also, I reserve any discussion of the taxonomy of the group and follow the present arrangement of the subfamilies and tribes. It may turn out, as Perkins has thought, that the group represents a superfamily but certainly it will form a very small and decimated one.

Where duplicate specimens exist, they will be deposited in the United States National Museum, Washington, D.C., U.S.A., as co-types. All specimens were described after being mounted in xylol-balsam.

DEDICATION.

This small contribution and result of pleasant labor is dedicated to the genius of mankind, more especially to that form of it expressed in monistic philosophy whose conceived perception I think is the highest attainment reached by man. It embraces the kernel of bald truth as far as experience and reflection have detected it and sums up the known and unknown of countless generations of men and the countless efforts of thinkers of all ages, nationalities, peoples, civilisations and schools, religious or otherwise. I therefore respectfully dedicate

* Contribution No. 4, Entomological Laboratory, Sugar Experiment Stations, Mackay, Queensland.

each new species to monistic philosophers, whole or in part, not as a small memorial to each but rather as symbolising through each man's life, some of the highest milestones yet reached in the progressive development of the nervous system in man. This is a high dedication for so small a work. As a rule, one man or group of men form but poor symbols and in a sense are falsely set up as such, since it leads to hero-worship and idolatry to do so. But these men must be taken to represent the ideas behind them, for which they lived and worked. In this sense, they represent inquiring humanity, striving to penetrate the unknown, to disperse superstition and false religions and to attain to complete understanding of the relations of mankind to the universe, thus attaining human justice and unity, through a complete knowledge of his nature.

On the other hand, the gregarious nature of man has so debased his independence of character that it is undoubtedly true that only the exceptional individual differentiates himself from the fold and becomes the inquiring part of humanity. From this point of view, these men are leaders and what we designate as great. That is no reason for worshipping them, however. They illustrate what humanity is capable of and that it is not necessary in order to live aright to subordinate one's mind to stultifying, more or less degrading and certainly misleading dogmatisms, nor to conventionalities, nor to every whim of fashion or authority. These men, too, represent some of the highest points yet reached in the building which humanity is slowly constructing while the foundations and framework are composed of the common, ordinary individuals of many kinds and degrees of goodness, badness and indifference, but nevertheless essentially a part of the whole building and the source of all its perfections.

HYMENOPTERA CHALCIDOIDEA.

FAMILY MYMARIDÆ Haliday.

SUBFAMILY GONATOCERINÆ Howard.

TRIBE OOCTONINI.

GENUS OOCTONUS Haliday.

1. OOCTONUS AUSTRALIENSIS Perkins.

Perkins, 1905, pp. 191, 193, 194, 195, pl. XIII, fig. 2 (lowest two figs.).

Idem, 1906, p. xxiv.

“*Hab.*: Cairns, Queensland; two examples extracted from eggs of a conspicuous *Tettigonia* common in the canefields” (Perkins, 1905); in the second citation, Perkins records the host as “Eggs of *Tettigonia* (*albida* or *parthaon*).”

I have not seen this species as yet nor any others from Australia.

TRIBE GONATOCERINI.

GENUS LEIMACIS Foerster.

1. **LEIMACIS LOMONOSOFFI** new species.

Female:—Length, 0.70 mm.; moderately small for the family.

General color bright lemon-yellow, the tip of the ovipositor sheaths and pronotum dusky black; eyes and ocelli bright red; antennal flagellum, venation, cephalic margin of the fore wing (somewhat) and distal tarsal joints dusky black; remaining joints of all legs, antennal scape and pedicel concolorous with body. Wings hyaline but slightly suffused with dusky, especially proximad.

With the habitus of an *Anagrus* but the antennæ but 8-jointed and tarsi 5-jointed. Fore wings moderate, resembling somewhat those of an *Oligosita*, moderately narrow and gradually widening out as far as the apex of the proximal two thirds, then more rapidly widening especially because the cephalic margin becomes convex; discal ciliation not regular, grouped irregularly, moderately sparse and fine, about seven to eight longitudinal lines across the widest portion of the wing, including a line across the margins, arranged in a curved group of three lines in the disto-cephalic half of the blade, the lines reaching the apex and there joining another group of three lines in the disto-caudal half of the blade which are straighter and the cephalic line of which is short (at the most including four cilia) and over the centre of the others; thus but two of these lines reach the apex; proximad, each group of lines straggles out to one and the cilia become smaller; other discal ciliation absent, hence there are large naked spaces in the blade. Marginal cilia of fore wing moderately long and subequal along both margins, the longest cilia about three fourths the wing's greatest width. Caudal dilatation of fore wing (along caudal margin) small, just indicated. Marginal and submarginal veins long and subequal, the former about ten times longer than its average width, obelavate, terminating along the costal edge, hence the "stigmatal" vein (or downward prolongation of the marginal vein) is absent. The marginal vein is hard to differentiate from the costal wing margin; it bears a large seta at its apex and two others of nearly equal size at its base and middle respectively (besides about half a dozen small setæ). Posterior wings very narrow, acuminate, its venation at apex bearing four hooklets; discal ciliation consisting of a single line along the cephalic margin and a paired line along the caudal margin, absent elsewhere; marginal cilia moderate, the longest (caudad) about thrice the width of the blade, those of the cephalic margin more than a half shorter.

Abdomen sessile, conic-ovate, slightly longer than the thorax, its segments unequal, the sheaths of the ovipositor distinctly exerted but only for a short length (about a fifth of the abdomen's length). Base of abdomen rounded, subsessile in appearance, not broadly, truncately attached. Tibial spurs single,

short, the cephalic one forming a normal strigil; tarsal joints moderate in length, shortening distad. Ovipositor running nearly the whole abdomen's length. Mesophragma absent.

Antennæ 8-jointed, resembling those of *Anagrus*. Scape with its bulb long, thrice the length of the usual pedicel, the latter four or five times the size of the small proximal funicle joint, which, however, is longer than wide; remaining portion of antenna somewhat like that of *Anagrus armatus* (Ashmead), the joints gradually widening distad; joints 2 and 3 subequal in length but 3 is stouter; 4 still stouter, cylindrical, subequal in length to 3 or about a fourth shorter; 5 a fourth shorter than 4 and stouter, yet still cylindrical and about twice longer than wide. Club ovate and stouter, about equal to the combined length of the two joints preceding, bearing several obliquely longitudinal sulci, which give the appearance of lamellate segmentation as in the club of *Stethynium*. Pubescence of antenna apparently absent but sparse and thin.

(From one specimen, 1/6-inch objective, 1-inch optic, Bausch and Lomb.)

Male:—Unknown.

Described from a single female specimen found dead, adhering to the under surface of a leaf of a shrub among a scattered mass of minute, elliptical white eggs apparently those of a mite; the shrub was growing along the east edge of the Mulgrave River about a mile south of Nelson, N.Q.

The specimen was taken on November 28, 1911.

Habitat: Australia—Queensland (Nelson, Cairns District).

Type: No. *Hy*/1068, Queensland Museum, Brisbane, one female in xylol-balsam.

Respectfully dedicated to the Russian peasant, Michael Wassiliewitsch Lomonosoff, afterward physical chemist, professor and man of affairs, one of the fathers of modern chemistry and profound research scholar.

GENUS ALAPTUS Haliday.

All in normal position.

1. ALAPTUS IMMATURUS Perkins.

Perkins, 1905, pp. 188, 191, 193, 194, 197, pl. XII, fig. 5; 1906, p. xxiv; 1910, p. 661.

This species was briefly described by Perkins (1905) from specimens reared from sugarcane leaves at Bundaberg, Queensland. I have captured what appears to be a female specimen at Babinda, Queensland, October 29, 1911. This specimen was found crawling over the under surface of a leaf of imported

citron growing wild near the jungle and which was infested with leafhoppers (jassids and fulgorids) and doubtless psocids. The description of *immaturus* omits all details of the wings but the specimen before me agrees in general with the figure of the antenna published with the description and also is pallid lemon-yellow in colour, with the two basal antennal joints concolorous, the flagellum darker. I believe, therefore, that *immaturus* is the species in question, though it is possible that this is not so, the wings being different. I add the following descriptive details and compare the species with some American forms, specimens of which I have before me: The fore wings are normal and margined with brownish; their marginal cilia are very long, longest caudo-distad, there about thrice the greatest wing width; as usual they are pallid a short distance out from the wing edge, forming the usual halo-like clear path around the margin of the wing at apex; the discal ciliation is absent with the exception of a single line along the caudal margin and a double line along the cephalic margin; proximad, some distance out from the venation, is a single central isolated cilium and another at about the base of the distal third of the wing; near this, just caudo-distad is a line of five cilia, near the inner of the two lines along the cephalic margin; this short line does not reach the wing apex by over a third of its own length; all of these cilia in reality form the long inner line of cilia near the cephalic margin. The fore wings are hyaline, but clouded somewhat near base. The caudal dilatation along the caudal margin opposite the venation is very acute and resembles the fin of a fish; its pointed, sharp apex forms distad a concave curve with the caudal margin of the wing. Marginal vein of fore wing long, about six or more times longer than wide but shorter than the submarginal vein. Caudal wings are slender clavate, gradually widening distad, obtusely pointed at apex and bearing but a single line of discal ciliation, which does not reach the apex and which is not quite central. Its marginal cilia are not quite as long as those of the fore wing; the blade is dusky and obscurely maculated.

Tarsal joints shortening distad, the proximal joint much the longest, moderately long. Antennal pubescence normal.

This Australian species differs from the American *cacilii* Girault very much; the latter has a longer scape and pedicel and the second funicle joint is longer in its relation to the first; the fore wings in *cacilii* are narrower and their discal ciliation (the line of five cilia) is much farther caudad and more central; the posterior wings are more clavate, hence broader. The general body color is more intense than with *immaturus* whose color is more or less inconspicuous and obscure. From the American *iceryæ* Riley, it differs not so much in color but the scape is shorter in *immaturus* and the funicle joints longer; the first and second funicle joints in the Australian species, for example, are twice the length respectively of the corresponding segments in *iceryæ*. Again, the fore wings of the latter are narrower, bear less midlongitudinal discal

cilia (only one or two cilia in the midlongitudinal line); the caudal wings are about the same in each species. The species cannot be confused with either the English *minimus* Walker or the American *intonsipennis* Girault which have the long proximal funicle joints of the antennæ and the different midlongitudinal discal ciliation of the fore wings—none in *minimus** and in *intonsipennis* the single long line; nor with the species *globosicornis* Girault which has the characteristic submoniliform antennal funicle.

These notes were taken from the specimen above mentioned, mounted in xylol-balsam, 1/6-inch objective, 1-inch optic, Bausch and Lomb. Subsequently a female at Herberton, N.Q., December 28, 1912 and one at Nelson, April 10, 1912, both on windows.

Habitat: Australia—Bundaberg, Herberton and the Cairns District, N.Q. Sandwich Islands—Oahu (Perkins, 1910, p. 661).

2. ALAPTUS MÜLLERI new species.

Female:—Length, 0.28 mm.; about normal in size for the genus.

General color deep brown, the abdomen somewhat darker. Eyes and ocelli dark reddish; antennæ and legs concolorous with the body but the scape of the former and the femora and tibiæ of the latter are somewhat darker. Fore wings hyaline, except at base. Posterior wings dusky and maculate. Fore wings margined usually with brownish.

Unlike in antennal and wing structure any species of the genus but more nearly allied with *minimus* Walker than to any other species. Differing from *minimus* principally in bearing more discal ciliation on the fore wing—besides the two rows along the cephalic wing margin and one row along the caudal edge there are four cilia in the midlongitudinal line of the wing from near the apex and a line of three cilia farther proximad, running distad from the distal half of the blade and not in a straight line; these two lines are not very far apart from each other (proximo-distad), only about twice the distance between any two cilia in either of the lines. If joined, they would form one continuous line, reaching nearly from the apex to the middle of the wing.

The species *minimus* bears no true midlongitudinal discal ciliation on the fore wing. The antennæ are nearly similar to those of *minimus* but the pedicel is distinctly longer than the first funicle joint; the second joint as in *minimus* is much the longest of the funicle, comparatively long and slender. From the American *intonsipennis*, *mülleri* differs in general body color being brown

* In regard to the genus *Alaptus*, it must be held in mind that the fore wings of all species so far seen by me bear two distinct rows of discal cilia along the cephalic edge and one along the caudal. Thus *intonsipennis* differs from *minimus* really in bearing an additional line of discal ciliation. This detail has been confused by me in my former treatment of this genus.

instead of black and in bearing the longer antennal pedicel; besides its midlongitudinal line of discal cilia of the fore wing is nearer the cephalic margin, is longer and continuous. From the American species *globosicornis*, this species may be distinguished readily by the marked differences in antennal structure; moreover, it has more discal ciliation and both of its wings are somewhat broader but the two species agree nearly in general coloration yet *mülleri* is darker brown. From the species *iceryæ* Riley, *cacilii* Girault and *eriococci* Girault it differs again in bearing more abundant discal ciliation—*iceryæ* only one or two cilia, *cacilii* only a row of from three to six cilia, the row central and distant from the wing apex and *eriococci* three or four cilia, similarly situated; *cacilii* is distinctly different in general coloration, bears narrower fore wings and the third funicle joint is longer in relation to the fifth; *iceryæ* is more olivaceous, less intensely brown than *mülleri*, its proximal two funicle joints are much shorter and its wings narrower; *eriococci* is more closely allied but its proximal funicle joint is shorter, especially in its relation to funicle joint 5, which is distinctly longer than it. If anything, funicle joint 5 in *mülleri* is slightly shorter than funicle joint 1. From *immaturus* Perkins, *mülleri* differs in its darker coloration, in the arrangement of the discal ciliation of the fore wing and as follows: the second joint of the antennal funicle in *mülleri* is distinctly longer, also the pedicel; the venation of the fore wing is distinctly shorter and the antennal scape is longer and more slender.

(From one specimen, 1/6-inch objective, 1-inch optic, Bausch and Lomb.)

Male:—Unknown.

Described from a single female specimen mounted in xylol-balsam and received for identification from Dr. L. O. Howard, Chief of the Bureau of Entomology, U.S. Department of Agriculture, Washington, D.C., U.S.A., and bearing the label "871. Swan River, W. Austr. G. Compere." Dedicated to Johannes Müller, the great student of comparative physiology.

Habitat: Australia—West Australia (Swan River).

Type: No. Hy/1052, Queensland Museum, Brisbane, Q., one female in balsam. (In the centre of the slide.)

3. ALAPTUS GLOBOSICORNIS Girault.

A single female of what I think cannot be otherwise than this species was captured while writing at a table in an hotel at Nelson, N.Q., December 5, 1911. The specimen was barely visible as it walked along over the surface of some paper and was noticed by accident only. It is greyish in general coloration, with the narrow scutellum light orange, thus differing from a specimen of the species from Honolulu, Hawaii, which is deep brown. Also, the fore wing bears

but a single discal cilium. Nevertheless, I cannot distinguish them structurally. In the original description of *globosicornis*, the second funicle joint is figured quite too large in relation to joint 1; in both of the specimens now before me (the one recorded from Hawaii, the other captured in Queensland) joints 1 and 2 of the funicle are subequal and wider than long; joint 3 is decidedly longer than either 1 or 2 and globular-ovate, longer than wide and the remaining joints enlarge in proportion. If this is not true with the types of *globosicornis*, the antennæ of that species being as figured, then there must be at least two species concerned here, if not three, since differences in coloration would then amount (perhaps) to a specific character. Girault (1911a) makes a remark, however, about the proximal funicle joint as figured in the original description of *globosicornis* which leads to the same inference as that above—namely, that the original figure is wrong in respect to the first two joints of the antennal funicle.

Later on I captured another female and two males from the panes of a window. The two males were taken from the windows of a barn on a wheat farm at Roma, Queensland, October 6, 1911; while the female was taken from a window in workmen's quarters on a sugar farm at Nelson, N.Q., December 18, 1911. These all agreed in general coloration and structure of the wings. The male antennæ heretofore unknown are now described: Filiform, 10-jointed; funicle joints all longer than wide, the first shortest, a fourth or more shorter than the second; joints 2-7 subequal in length but 2 and 3 equal and each slightly shorter than joints 4-7 taken separately; distal joint conical but subequal in length to joint 7 of the funicle.

In the two male specimens the single central discal cilium was missing from the fore wings; one of them had also become nearly black since its immersion in xylol-balsam.

Later on at the same place that the last female was captured I obtained two more females on December 19, 1911 (plus one female of the new species described below) and another on the following day. One of these females had both of the midlongitudinal discal cilia present; all were colored like the others captured in Queensland. Also from windows at Nelson, two females, January 23, 1912; three females two days later and three on January 26, 1912.

The two following geographical varieties:—

1. *Alaptus globosicornis hawaiiensis* new variety, deep reddish brown. (See Girault, 1911a, p. 132.)

2. *Alaptus globosicornis australiensis* new variety, greyish, the scutellum light orange.

Type of hawaiiensis: No. Hy/1053, Queensland Museum, Brisbane, 1 ♀ in xylol-balsam (Honolulu, August 3, 1900).

Type of australiensis: No. Hy/1054, Queensland Museum, Brisbane, 3 ♀'s in xylol-balsam, 1 slide (Nelson, N.Q., January 26, 1912).

4. ALAPTUS NEWTONI new species.

Female:—Length, 0.25 mm.; a mere speck; usual in size for the genus.

General color greyish, dusky or ashy* like the specimens of *globosicornis* noted in foregoing; all of the legs pallid, including the coxæ; the scape and pedicel also dusky, the remaining part of the antenna concolorous with the dusky, ashy grey of the body. Fore wing very lightly uniformly fumated throughout, the posterior wings distinctly splotched with dusky.

Exactly similar to the above specimens of *globosicornis* in all particulars excepting these: the proximal tarsal joints of the legs are shorter and the proximal funicle joints of the antennæ are longer and unequal, not about equal and longer than wide but each distinctly longer than wide, cylindrical, the second joint over a fourth longer than the first and distinctly about twice longer than its width, which is uniform. Also the funicle joints are not globular but from the third, cylindrical ovate. There are two discal cilia in the midlongitudinal line of the fore wing, isolated and situated as with *globosicornis*.

From *mülleri* this species differs in general coloration, its fore wings are narrower and with less midlongitudinal discal ciliation and in its antenna the distal funicle joint is barely shorter than the second though wider; but in *mülleri* the distal funicle joint is distinctly shorter than funicle joint 2; the latter joint is longer in *mülleri*. From the remaining Australian species, *immaturus*, this species differs in bearing narrower fore wings with less midlongitudinal discal cilia; the details of coloration also differ. In antennal structure it somewhat resembles *cacilii* of North America but upon comparison the two species are seen to have distinct habiti and furthermore *cacilii* is of a distinct bright yellow in color,† its antennal club is longer and in the antennal funicle the second funicle joint is distinctly longer than the distal joint and longer relatively to joint 1 than is the case with *newtoni*; also in *cacilii* the proximal joints of the tarsi are distinctly longer than those of *newtoni*. From *iceryæ* Riley, *newtoni* differs not so much, in fact resembling it closely; but in *iceryæ* the proximal funicle joints are shorter, thus funicle 1 is subquadrate, barely longer than wide and funicle 2 is only one and a-half times its own width, if that much hence in *iceryæ* funicle 3 is longest of the three proximal funicle joints; in *newtoni* funicle joint 2 slightly the longest. From *eriococci* Girault, another species described from North America, *newtoni* differs not very much but the legs are paler, the fore wings bear but two discal cilia (in *eriococci*

* Some of the specimens later were bright lemon-yellow.

† See previous footnote.

there are four, the statement made by Girault, 1908, p. 193, in the table of species of *Alaptus* being erroneous, the statement in the original description of *eriococci* being correct); also the general body coloration appears to be different, lighter in *newtoni*.

(From one specimen, the same magnification.)

Male:—Unknown.

Described at first from a single female specimen mounted in balsam and captured from the panes of a window in men's quarters on a sugar farm near Nelson, N.Q., December 19, 1911. Later four females were obtained from a window in an empty dwelling on Thursday Island, March 13 and 14, 1912. One of these bore five cilia in the midlongitudinal line of the fore wing, from the middle, each end of the line about equidistant from apex and caudal excision respectively.

Habitat: Queensland (Nelson, Cairns District; Thursday Island, Torres Strait).

Type: No. Hy/1055, Queensland Museum, Brisbane, one female in xylol-balsam (mounted with two females of *A. globosicornis* Girault as above identified and the type female of *Anaphoidea harveyi* Girault*).

Although resembling closely *cæcili* and *eriococci*, I think this species is quite distinct. It is respectfully dedicated to Sir Isaac Newton, who discovered gravitation.

DIAGNOSTIC ARRANGEMENT OF THE AUSTRALIAN SPECIES OF *ALAPTUS*_s
HALIDAY.

FEMALES.

Funicle joints of antennæ all short, wider than long or subglobose. Fore wings with but one or two midlongitudinal discal cilia.

First two funicle joints subequal, wider than long, small.

Deep reddish brown *globosicornis hawaiiensis* Girault.

Greyish, ashy, the scutellum light orange *globosicornis australiensis* Girault.

Funicle joints of antenna not all short, wider than long or subglobose but at least the proximal joints cylindrical, more or less elongate and longer than wide, the distal joints usually cylindrical ovate. Fore wings usually with more than two midlongitudinal discal cilia.

Fore wing without discal cilia in the midlongitudinal line but of the two cephalic lines of discal cilia the inner stands out some distance from the wing margin forming a long line of cilia from apex nearly to venation. Second funicle joint longest, four times longer than wide.

Pale lemon-yellow, the two proximal joints of antenna concolorous *immaturus* Perkins.

* Described on a later page.

Fore wing with discal cilia in the midlongitudinal line.

The midlongitudinal discal cilia slightly cephalad consisting of about seven cilia in one line, the cilia far apart, the line in the distal half of the blade; second funicle joint longest, the first shorter than the third; second funicle joint four times longer than wide.

Deep brown *mülleri* Girault.

The midlongitudinal discal ciliation consisting of not more than five (usually less) cilia in a short line which is about midway between apex of the wing and the venation; second funicle joint longest but only twice longer than wide, subequal in length to the pedicel.

Greyish dusky to lemon-yellow *newtoni* Girault.

GENUS LITUS Haliday.

1. *LITUS SCHLEIDENI* new species.

Female:—Length, 0.33 mm.; moderate in size for the genus; very minute.

Differing at once from the two known species of the genus in coloration; general color greyish black, the thorax and basal part of abdomen except a transverse band at the middle, lighter, greyish, the transverse band (the scutellum) still paler, pale yellow. All of legs and scape, pedicel and first funicle joint of the antennæ pallid the remaining portions of the antenna greyish black. Both wings fumated throughout with greyish.

Differing structurally from *cynipseus* Haliday (see Girault, 1911b, pp. 363-364) as follows: The proximal funicle joint, though much shorter than funicle joint 2, yet is distinctly longer than wide and slender; the fore wings are curved; the posterior wings are not maculated. From *enocki* Howard, it differs structurally in having the two proximal funicle joints unequal, joint 1 only about two thirds the length of joint 2.

Fore wings slender, nearly as in *Alaptus*, the dilatation along the caudal margin opposite the marginal vein conspicuous, the wing being slightly the widest across it; discal ciliation of the fore wing not dense but distinct, consisting of about five lines, a pair along each margin and a short line in the middle of the blade (midway between apex of venation and apex of the blade), sometimes extending quite to the apex but leaving a variable, more or less distinct naked area in the blade just back from the apex; discal ciliation disappearing proximad out from the apex of the marginal vein a distance over the latter's length (in other words, the proximal half of the blade is naked). Marginal cilia long as in *Alaptus*, the longest fully three and a half times the greatest width of the wing; the usual clear path around the wing margin distad; the fore wing is bent at its proximal three fourths. Marginal vein moderate in

length, five times longer than wide. Posterior wings slender and straight, slightly narrower than the narrow part of the fore wing (just distad of the dilatation), bearing a single line of discal ciliation along the cephalic margin and another, more conspicuous long line from the apex and slightly cephalad of the midlongitudinal line of the blade. Longest marginal cilia of caudal wing somewhat shorter than the corresponding cilia of the fore wing.

Abdomen short, sessile, ovate, the valves of the ovipositor slightly exerted; mesophragma present; the five tarsal joints short. Antennæ 9-jointed; pedicel globular, much wider than the first funicle joint; proximal two funicle joints cylindrical, the others gradually enlarging; funicle joint 2 longest, joint 3 only slightly longer than joint 1 and slightly thickening distad; joints 4, 5 and 6 each subequal to joint 3 in length but cylindrical oval, 6 somewhat the widest; club of antenna long-ovate, equal to or somewhat longer than the preceding three joints. Funicle joint 5 sometimes slightly shorter than 4 and 6. Club of antenna no wider than the funicle distad. Pubescence of antenna consisting of whorls of soft, short setæ, much as in *Alaptus* Haliday.

(From two specimens, the same magnification as with species of previous genera.)

Male:—Unknown.

Described from two female specimens captured while running over the panes of a window in an empty dwelling at Herberton, N.Q., December 28, 1911. Much smaller than *Alaptus immaturus* Perkins. Dedicated to Matthias Schleiden who discovered the living cell.

Habitat: Queensland (Herberton).

Type: No. Hy/1051, Queensland Museum, Brisbane, one female in xylol-balsam (mounted with a female of *Alaptus immaturus* Perkins).

GENUS DICOPUS Enoch.

1. DICOPUS PSYCHE Girault.

Girault, 1912, pp. 22-23.

This species, recently described from Suva, Fiji, from a single male specimen, is represented I think by a single female captured from the panes of a window in a private residence late in the afternoon of June 10, 1912 at Nelson, N.Q. The body coloration is much darker than described for the male, being sooty or greyish black, but the antenna and legs are greyish and the fore wings fumated as described for *psyche*; it agrees with the description of the latter excepting as noted. The posterior wings are petiolate out to the base of the distal third, there broadened into a blade. The specimen resembles the type

of the genus as figured by Enoch with the exception of antennal structure and discal ciliation. Thus, from the English species it differs in not having the scape angular along its dorsal margin and much longer in proportion to the pedicel (thrice or more longer), the funicle joints are more uneven, the second, third and fourth joints being elongate, subequal, each about twice the length of the first which is subequal in length to the pedicel or slightly shorter and about twice longer than wide; the two distal funicle joints are subequal, cylindrical ovate, joint 7 being intermediate in length between them and the three joints preceding it; either of the distal two funicle joints is longer than the proximal joint of the funicle. The club is slender, conic-ovate and acutely pointed, not much longer, however, than the combined length of the three preceding joints. The antennæ are thus much more slender than with the type species and resemble those of *camptoptera* Foerster. It is extremely gratifying to be able to connect this female specimen with the Fijian *psyche*, since it leaves little or no doubt that the male of the genus has been correctly described. The antennal club and scape of this female are subequal in length. Parapsidal furrows complete.

Habitat: Fijian Islands (Suva); Australia—Nelson, near Cairns, Queensland.

GENUS GONATOCERUS Nees.

All in normal position.

1. GONATOCERUS BACONI new species.

Male:—Length, 0.90 mm.; moderate in size for the genus.

General color golden yellow, the distal tarsal joints, antennal flagellum, distal half of the abdomen and distal portions of the thorax (more obscurely), black. Scape, pedicel, middles of femora, most of all tibiæ, venation and portions of the head dusky yellowish. Wings hyaline or sometimes with a brownish appearance.

Fore wings slender and graceful, the blade paddle-shaped, narrowing like a handle just distad of the venation, the blade bearing about fifteen longitudinal lines of discal cilia, the latter dense and moderately fine; marginal cilia of fore wing rather long for the genus but really for the family, only moderate in length, the longest (disto-caudad) slightly less than half the wing's greatest width, the cilia gradually lengthening from the cephalic margin around the apex. The longest marginal cilia of the fore wing are about equal to the longest cilia of the posterior wing (caudal margin). Posterior wing very narrow, pointed, not at all widened across the venation, its cephalic marginal cilia very short, those of the caudal margin about two and a half times the blade's width at its middle. Caudal wings with a double line of discal ciliation along each margin; the lines are complete.

Two tines of cephalic tibial spur unequal; strigil well developed; tarsal joints nearly all equal, moderately short, the proximal joints, however, nearly twice the length of any of the other four, moderately long.

Antennæ 13-jointed, filiform, flagellar joints longitudinally striate, short, the first somewhat shorter than the others which are cylindrical oval and slightly over twice longer than wide; distal joint slenderer; pedicel obconic, distinctly shorter than the first funicle joint; scape short but longer than any other joint. Pubescence of antennæ short, moderate, inconspicuous.

(From two specimens, 2/3-inch objective, 1-inch optic, Bausch and Lomb.)

Female:—Unknown.

Described from the two male specimens captured together while sweeping low vegetation on sand, west bank of the Pioneer River, Mackay, Queensland, October 15, 1911 (A.A.G.). Dedicated to the Roman Catholic friar, Roger Bacon, who, in an early superstitious and ignorant century, long since laid down the basis for science and reason. He was centuries ahead of his time.

Habitat: Australia—Queensland (Mackay).

Type: No. Hy/1036, Queensland Museum, Brisbane, Queensland, the above two males in xylol-balsam, one slide.

This species resembles somewhat the North American *Gonatocerus aureus* Girault but differs from it in detail—for instance, the fore wings are more gracefully narrowed just distad of the venation, hence differently shaped.

2. GONATOCERUS DARWINI new species.

Female:—Length, 0.50 mm.; moderately small for the genus.

General color brown, the base of the abdomen golden yellow, the legs, antennæ and venation concolorous with the body, excepting the knees and trochanters which are paler. Wings hyaline.

Differs from the foregoing species in bearing much broader fore wings, shorter marginal cilia and darker general color. Of the American species falling in the group containing *anthonomi*, *americanus*, *texasus*, *brunneus*, *aureus* and *pygmaeus* and may be separated from the first as follows: The marginal cilia of the fore wing at apex are longer in *darwinii*, at least a fourth longer and the cilia caudad are also longer in proportion than those at the same place in the American species; the four proximal funicle joints in *darwinii* are all decidedly smaller and the sixth joint is also shorter and more rounded. Moreover, the base of the abdomen is yellow in *darwinii* and the pale streaks on the mesoscutum absent. Not very likely to be confused with the other American species of the same group, which differ either in general coloration or else in some structural

character. The fore wings bear about twenty-five lines of discal ciliation across their widest portion; the caudal wings bear a paired line along each margin and a similar but shorter line down the midlongitudinal line of the wing from the apex.

Antennæ 11-jointed, normal; proximal four funicle joints uneven, each much smaller than the pedicel; joint 4 shortest of them, wider than long; funicle joint 5 abruptly larger, subequal to the pedicel, more than twice the size of joint 4; 6 narrower and a third shorter than 5; 7 subequal to 5 while joint 8 is slightly shorter than it; joint 6 smaller than the joint preceding and the joints following. Scape broad, moderate in length. Funicle joints 5, 7 and 8 subequal, joint 6 intermediate between them and the four small proximal funicle joints.

(From two specimens, the same magnification.)

Male:—Unknown.

Described from two female specimens captured October 15 and 19, 1911 while sweeping along the left bank of the Pioneer River, Mackay, Queensland; low vegetation on sand. Dedicated respectfully to Charles Darwin.

Habitat: Queensland, Mackay.

Type: No. Hy/1037, Queensland Museum, Brisbane, one female on a slide.

3. GONATOCERUS HAECKELI new species.

Female:—Length, 0.65 mm.; moderately small for the genus.

General color uniform black suffused with dark brownish; legs dusky yellowish, the caudal tibiæ brown, the trochanters, knees and tips of tibiae yellowish, the distal tarsal joint dusky. Wings hyaline except faint cloudiness under the submarginal vein in the fore wing. Venation brown. Fore wing not margined with yellowish. Antennæ concolorous with the body.

Differs from *darwini* in bearing a naked space in the discal ciliation of the fore wing under (caudad) the marginal vein and in having the valves of the ovipositor distinctly but shortly exerted but less than with *rivalis* Girault and *ater* Foerster, as well as in other characters. Because of its subexserted ovipositor (valves) this species falls in the group of species containing *maga* Girault, *rivalis* Girault and *ater* Foerster and may be separated from the former by its broader fore wings which are not slender and graceful but bear about twenty-two longitudinal lines of discal cilia and are similar, or nearly, to those of *anthonomi*; also in *haeckeli* funicle joint 3 is much smaller, not subequal to joint 5 of the funicle; the fore wings are hyaline excepting as pointed out above; the antennæ of *haeckeli* are not slender as with *maga* and *rivalis*. From the latter, this species differs markedly in coloration, no yellow being present and also in having the joints 2 and 3 of the antennal funicle short. From the European *ater* Foerster, *haeckeli* differs markedly in the size of the wings and less noticeably in many other characteristics.

Abdomen conic-ovate, slender; fore wings nearly as in *darwini* but they are somewhat broader, the marginal cilia slightly shorter and caudad of the marginal vein no discal cilia are present excepting a line along the caudal edge of the submarginal vein arising from the wing membrane and a shorter, oblique line of about five cilia running caudo-distad from proximal end of the marginal vein; this clear area projects into the discal ciliation in the form somewhat of a wedge.

Antenna 11-jointed, usual; first four funicle joints short and subequal, each distinctly shorter than the pedicel and subquadrate or not much longer than wide; distal four joints of the funicle larger, subequal to or slightly larger than the pedicel, distinctly longer than wide, broader, joints 5 and 7 subequal, a fourth longer than joints 6 and 8 which are also subequal to each other.

(From a single specimen, the same magnification.)

Male:—The same but there is more yellow on the body, the base of the abdomen in the dorsal aspect is yellow, the flagellum paler, its joints short and subequal, each only about one and a-half times longer than broad but all longer than the pedicel.

(From one specimen, the same magnification.)

Described at first from a single female specimen captured from the panes of a window in a grocery store, Port Douglas, N.Q., October 30, 1911. Respectfully dedicated to Ernst Haeckel. Subsequently a female was taken by sweeping along the top of the coast range at Double Island (Cairns), N.Q., elevation about 450 feet, December 24, 1911. The fifth funicle joint was proportionately smaller, the femora and intermediate tibiae less dusky, lemon-yellow.

Habitat: Queensland (Port Douglas and Mossman; Double Island and Aloomba near Cairns).

Types: No. Hy/1038, Queensland Museum, Brisbane, one male, one female in xylol-balsam. (Port Douglas, female; male, Double Island.)

On a small island called Double Island about three miles off the coast from a bathing resort just north of Cairns, I captured a male by sweeping, Christmas Day, 1911. This specimen had scattered ciliation under the venation which was not conspicuous. Also a male at Mossman, N.Q., on a window, 31 October, 1911, and a pair at Aloomba, N.Q., by sweeping grass in a forest, July 7.

4. GONATOCERUS METCHNIKOFFI new species.

Female:—Length, 1.05 mm.; rather large for the genus.

General color deep, rich brown, the base of the abdomen narrowly, pale yellowish; scape and to a less extent the pedicel, greenish yellow, the other portions of the antennae nearly concolorous but with a suffusion of olivaceous; coxae, femora and distal halves of tibiae blackish or deep brown, dark, the trochanters, knees, proximal halves of the tibiae (all of cephalic tibiae) lighter brown.

suffused with pink,* contrasting; fourth tarsal joint paler, the distal joint dusky. Venation olivaceous. Wings hyaline, the fore wings not margined with dusky.

Differing from *baconi* in general coloration and much broader fore wings; from *darwini* also in being much darker, more specifically in bearing coarser discal ciliation in the fore wing, which does not extend to the apex of the venation, in bearing a somewhat longer marginal vein, longer marginal cilia at the cephalic margin of both wings and in having no midlongitudinal discal ciliation in the posterior wing (conspicuous distad in *darwini*); also in the antennæ of this species the proximal funicle joint is distinctly longer than that of *darwini*, the four distal funicle joints are larger and between the fifth and sixth joints there is not so much difference in size, these four joints in fact nearly subequal in *metchnikoffi*, not so in *darwini*, joint 6 being distinctly smallest of the four. From *haeckeli* this species differs in having the legs darker, the fore wings with much coarser discal cilia, the valves of the ovipositor not exerted and the marginal cilia along the cephalic margin of the fore wing longer.

Fore wings moderately broad, their discal ciliation moderately coarse, arranged only in about fifteen longitudinal lines across the widest blade portion, their marginal ciliation shortest disto-cephalad; proximal tarsal joint much the longest of the five; caudal wings bearing a paired line only of discal ciliation along each margin, narrow, not broadened across apex of their venation, their marginal cilia caudad longer than the longest marginal cilia of the fore wing. Tibial spurs single. Ovipositor not exerted.

Antennæ normal; pedicel longer than any of the first four funicle joints; the latter all short, opposed in this respect to the four distal joints, all of which are over twice the size of any of them. Proximal funicle joint longest of the first four, then joints 2, 3, and 4 gradually increase in size, joints 2 and 3 globose-ovate; joints 5-8 subequal or else very slightly decreasing in length, cylindrical ovate twice longer than broad and each distinctly longer than the pedicel; club shorter than the scape.

(From one specimen, the same magnification.)

Male:—Unknown.

Described from a single female specimen captured from the under surface of a leaf of *Ficus* species growing along the east bank of the Mulgrave River near Nelson, N.Q., during the afternoon of December 18, 1911. A species characterised by the grouping of the eight funicle joints of the antennæ into two groups of four subequal joints each, by its dark-brown color with the contrasting shadings on the legs, by the coarse discal ciliation of the fore wing and by the lack of midlongitudinal discal ciliation in the posterior wing. As

* After being mounted in xylol-balsam, the latter was stained pinkish from the body of this species as often noticed in the case of *Anagrus armatus* (Ashmead).

compared with the American species *anthonomi* Girault, this Australian species differs again in having the coarser discal ciliation of the fore wing and in having the distal funicle joints of the antennæ longer; there are also other minor differences, the most important of which are the lack of mid-longitudinal discal ciliation in the caudal wings and the shorter ciliated region of the disk of the fore wing. It has the general group likeness to *anthonomi*. Respectfully dedicated to Elie Metchnikoff.

Habitat: Australia—Queensland (Nelson).

Type: No. Hy/1039, Queensland Museum, Brisbane, the foregoing female.

5. GONATOCERUS HUXLEYI new species.

Female:—Length, 0.95 mm.; moderate in size for the genus.

General color black, the abdomen more brown, distinctly marked with yellow at base; antennæ and venation brown, the scape somewhat paler; coxæ, tibiæ and all tarsal joints brown, rest of legs pallid yellowish. Wings slightly, uniformly embrowned throughout.

Distinct from both *baconi* and *metchnikoffi* but somewhat similar to *haeckeli* and *darwini*, differing from both, however, in a number of points. From *darwini* in general coloration and in bearing broader fore wings; from *haeckeli* in that the discal ciliation of the fore wings extends normally under the venation, in that the tarsi are all brown and in that joints 4 and 6 of the funicle are larger, the fourth joint larger than the first (of the funicle). The fore wings bear about thirty-two lines of discal ciliation. The proximal tarsal joints in the caudal legs are longer here than in *haeckeli*.

Antennæ 11-jointed; funicle joints 1-4 gradually increasing in size, grouped together and opposed to the following four joints which are all distinctly larger; joints 5 and 7 of the funicle subequal, each slightly longer than joint 6 which is cylindrical oval but not quite twice longer than wide; joint 8 of the funicle slightly shorter than joint 7 and slightly stouter; proximal four funicle joints all distinctly shorter than the usual pedicel; club-joint long, cylindrical, tapering slightly distad and thickly covered with minute white dots.

(From one specimen, the same magnification.)

Male:—Unknown.

Described from a single female specimen taken from the window of a granary on a wheat farm at Roma, Queensland, October 6, 1911. Dedicated to Thomas Henry Huxley, the agnostic and doubter, champion of reason, truth and Darwin.

Habitat: Australia—Queensland (Roma).

Type: No. Hy/1040, Queensland Museum, Brisbane, the female in foregoing, mounted in xylol-balsam (with specimens of *Signiphora* and trichogrammatids).

6. GONATOCERUS COMPTEI new species.

Female:—Length, 1.00 mm.

General color bright golden yellow marked with black as follows: Faint stripes across the abdomen one to each segment, distal half of abdomen ventrad, most of antennæ, especially the distal three joints; cephalic part of mesonotum rectangularly across the meson, a triangular spot in the cephalic angle of each parapside; several spots along the base of the scutellum and the metanotum obscurely; also tip of the valves of the ovipositor. Antennæ dusky, darker distad, the lateral aspects of scape and pedicel golden yellow; legs yellow throughout, the posterior tibiæ and femora with some black; eyes and ocelli red. Venation dusky yellowish. Wings hyaline or nearly.

Similar in structure to *baconi* nearly but differing thus: The fore wings are somewhat broader, differ in shape and have shorter marginal cilia, the longest of the latter not more than a third of the wing's greatest width; there are about eighteen lines of discal cilia across the widest blade portion. The fore wings do not narrow like a handle proximad (just out from the venation). The proximal joints of the posterior tarsi are shorter and stouter. The caudal wings very narrow, acute at apex, bearing of discal ciliation only a paired line along each margin, its caudal marginal ciliation slightly longer than the longest marginal cilia of the fore wing. Ovipositor barely projecting beyond tip of the abdomen.

Antennæ normal for the genus. Second funicle joint longest, the third next longest or about subequal to it; joint 4 of the funicle a third shorter, not twice longer than wide as with joint 2, very slightly longer than joint 1, which is not quite as long as the small pedicel; joints 5 and 6 of funicle narrower but subequal to 4 and to each other; joints 7 and 8 subequal, longer by a fourth but not so long as joint 2.

(From two specimens, the same magnification.)

Male:—The same, the abdomen darker and also the legs. Antennæ filiform, the club and other funicle joints longitudinally striate; the flagellar joints gradually increasing in length distad, the club intermediate in length between the first and last funicle joints; pedicel shorter than the first funicle joint.

(From one specimen, the same magnification.)

Described at first from three females captured by sweeping in a forest adjoining the hamlet of Nelson, N.Q., February 18, 1912 (A. M. Lea and A. A. Girault). On June 30, 1912 a female was taken at an elevation of 500 feet in a forest at Nelson.

Dedicated to Auguste Comte, the positive philosopher, whose philosophic principles, although not always right, were based upon positivism, materialism, realism or experience combined with reason.

Habitat: Australia—(Nelson and Alooomba, near Cairns; Ingham; Port Douglas, N.Q.).

Types: No. Hy/1041. Queensland Museum, Brisbane, one male, one female (mounted on a slide, Nelson, May 26, 1912).

Subsequently a male and female were captured at Port Douglas, N.Q., March 25, 1912 from the windows of a general store. The wings were distinctly stained, the head black excepting narrowly around the eyes and about the clypeus and mouth. Also a pair at Nelson by sweeping floor of forest, May 26, 1912; when dipped in chloroform, they became blood-red. And two males, nine females at Alooomba, N.Q., July 7, 1912, sweeping grass in midforest; a female by sweeping grass and foliage, 1,000 feet, Pyramid Mountain, opposite Nelson, August 17, 1912; and two females at Ingham, N.Q., July 17, 1912 by sweeping grass in a boggy meadow bearing Pandanus.

7. GONATOCERUS CINGULATUS Perkins.

Perkins, 1905, pp. 193, 194, 195-196, pl. XIII, figs. 2, 6. 1906, p. xxiv.

Female:—Length, about 1.00 mm.

General color golden yellow, the base of the abdomen paler; distal half of abdomen, metanotum, much of the head and the antennæ, excepting scape and pedicel, black; antennal scape, pedicel, cephalic portion of mesonotum,* spot at the cephalic corner of each parapside and the legs dusky, suffused with yellowish. Venation dusky. Fore wings uniformly but not deeply stained. Caudal tibiæ darker; sometimes all the femora lighter.

Allied with *baconi* and *comptei* but remarkably like the North American *aureus* Girault. From *baconi* it may be distinguished by the shape of the fore wings which differ as with *comptei* but it resembles *baconi* in coloration. From *comptei* it differs essentially in the length of the proximal funicle joints of the antennæ, with *cingulatus* increasing in length to the fifth joint but in *comptei* funicle joints 4 and 5 are distinctly shorter than either 2 or 3. It differs not very much from *aureus*—but the scape is shorter, the other antennal joints stouter. Nevertheless, it is surprisingly similar.

(From four specimens, magnified the same.)

Male:—Described beyond.

Redescribed at first from four females captured from the windows of an empty dwelling at Thursday Island, Torres Strait, N.Q., Australia, March 13 and 14, 1912.

* See subsequent remarks.

This species should be compared with the North American *aureus* before its validity is accepted. I have compared it with a single female of that species as identified by myself but, although I think it very probably the same species, yet, for the present hold definite opinion in reserve. I could see no difference excepting those mentioned. If it is *aureus*, that species is widely distributed, since it occurs in North America and probably in Europe as I have noted elsewhere.

This is undoubtedly *cingulatus* Perkins, agreeing with his description with the exception of the "two adjacent spots on the front of the mesonotum which do not reach back to the middle." In the above specimens, seen from the dorsal aspect, the whole of the mesoscutum is dusky black except around the lateral and caudal margins; seen from the side, only the cephalic third of the scutum appears black and I believe some mistake has been made. The scutellum is colored in the same way. Also in the foregoing and following specimens the fifth funicle joint is longer than the fourth, the joints increasing in length from 1 to 5, which is longest; 6 and 7 are subequal and slightly shorter than 5, while joint 8 is shorter than 7, distinctly shorter than 5. However, the proportionate lengths vary somewhat and my specimens agree in general with the figure of the female antenna given by Perkins in the place cited. Sometimes joints 5 and 6 are subequal, funicle joint 7 somewhat shorter than either.

I have subsequently found the following specimens, including the male sex and I briefly describe it: A pair captured by sweeping grass near town, Thursday Island, March 13, 1912. A female by sweeping grass in an open forest near Nelson, N.Q., April 18, 1912. This specimen was more robust than usual, the fore wings somewhat broader, the proximal tarsal joints longer but otherwise I could not distinguish between it and the others. Also a male captured on Thursday Island, in a like situation, March 12, 1912 (open forest), and a female at Herberton, N.Q., on a window, December 28, 1911.

The male is the same as the female, the scape and pedicel of antennæ yellow suffused with dusky, the filiform flagellum longitudinally striate, the distal two thirds or half of the abdomen black. The first funicle joint is longer than the pedicel and a fourth shorter than the following joint which with the others increase slightly in length distad, the club-joint only slightly shorter than the one preceding, longer than the proximal funicle-joint.

Habitat: Australia—Queensland (Brisbane, Nelson near Cairns, Herberton and Thursday Island, Torres Strait).

Perkins (1906) records this species from the eggs of *Tettigonia albida*.

8. **GONATOCERUS LAMARCKI** new species.

Female:—Length, 0.55 mm.

Dusky yellowish brown suffused with golden yellow the base of the abdomen paler, yellow; the legs and antennae concolorous, the club of the latter darker. Wings as in *cingulatus*.

Closely related to *cingulatus* but differing in the particulars that follow: The proximal tarsal joints are shorter in all of the legs, in the intermediate and posterior legs barely longer than the following joints taken singly; the other tarsal joints are shorter in proportion; the marginal vein of the fore wing is a fourth shorter; the antennal joints are all shorter and stouter, the distal funicle joint longest of the funicle, not shorter for example than joint 5; joint 5 of the funicle is only one and a-half times longer than wide in *lamarcki* while in *cingulatus* it is twice longer than wide; funicle joint 6 in *lamarcki* is distinctly shorter than the preceding and following joint, only slightly shorter in *cingulatus*; moreover it is only subequal to the pedicel in length, longer than the pedicel in *cingulatus*. The one other difference is that of general coloration. Only the distal two funicle joints are longer than the pedicel; they are subequal. Joints 3 and 4 of funicle subequal, each slightly shorter than 5 while the latter is slightly shorter than either joints 7 or 8. Ovipositor reaching only slightly beyond the apex of the abdomen.

(From one specimen, the same magnification.)

Male:—Not known.

Described from a single female specimen captured by the sweeping net in an open field (grasses) near Cooktown, N.Q., February 4, 1912.

Dedicated to the great evolutionist Jean Baptiste De Lamarck whose doctrine of the inheritance of acquired characters lives on for ever as a monument to the genius of mankind.

Habitat: Australia—Cooktown, Queensland.

Type: No. Hy/1042, Queensland Museum, Brisbane, the forementioned female on a slide in xylol-balsam (mounted with two females of *Trichogramma australicum* Girault).

9. **GONATOCERUS DAVINCI** new species

Female:—Length, 1.30 mm.; large for the genus.

General color black, the immediate base of the abdomen in the dorsal aspect, the cephalic half of the mesopleura, lateral aspects of scape excepting a band at the base just above the bulla and two opposing spots in the middle one at each side, all of the legs excepting distal two or three tarsal joints, most of

caudal coxæ, caudal tibiæ, and some portions of the intermediate tibiæ pale lemon-yellow, the excepted portions black or brownish black. Ventral aspect of pedicel pale yellowish. Venation brown, the wings hyaline.

Allied to the group of species including *haeckeli*, *darwini*, *metchnikoffi* and *huxleyi*, resembling them in general habitus. However, differing from all in color and structurally similar only to the first two and the last. It most closely resembles *huxleyi* and *haeckeli* both in coloration and structure and the valves of the ovipositor are exerted slightly somewhat as in the North American species *rivalis*; but the funicle joints of the antennæ are longer, joint 5 is not twice the length of joint 4 of the funicle as in *haeckeli* but only one and a half times longer; there is no great disproportion between joints 5 and 6 of the funicle, the fourth funicle is not shorter than the first, as in *haeckeli*. Moreover in this species the marginal vein is longer; also the fourth funicle joint is longer than wide here, wider than long in *haeckeli*. The antennal club is also longer. From *darwini* this species may be distinguished in its being much more robust and in most of the points of difference mentioned for *haeckeli*; both wings are broader and the proximal tarsal joints of the intermediate legs are longer, the caudal wings bear much less discal ciliation, only several cilia at the apex. From the species *huxleyi* it differs in being more robust and in bearing a marginal vein of the fore wing which is about a fourth longer, in bearing more naked posterior wings and in having most of the fore wing naked under the venation with the exception of a line or two directly under the marginal vein. However, its longer marginal vein and different coloration must suffice as its characteristic as concerns *huxleyi*. The fore wings bear about thirty-two lines of discal ciliation; their longest marginal cilia are slightly shorter than the longest of the posterior wings and are not a sixth of the greatest wing width.

(From one specimen, the same magnification.)

Male:—Not known.

This description from a single female specimen captured by sweeping in an open forest near Nelson, N.Q., February 18, 1912 (A. M. Lea and A.A.G.). Dedicated to Leonardo Da Vinci, the manly Italian, one of the earliest of scientists.

Habitat: Australia—Queensland (Nelson near Cairns).

Type: No. *Hy/1043*, Queensland Museum, Brisbane, the forementioned specimen in xylol-balsam.

10. GONATOCERUS GOETHEI new species.

Female:—Length, 0.78 mm.

Predominating color pallid yellowish, the thoracic notum, head, distal half of abdomen more or less, antennal club nearly, posterior tibiæ and distal

two tarsal joints brownish. Remaining portions of legs concolorous; venation and remainder of antennæ olivaceous or yellowish dusky, the wings hyaline. Parapsidal furrows along each side margined with a paler color than the brown of the mesonotum. Caudal third of mesoscutum paler.

Resembles very much the species *darwini* from which it differs in general coloration and in having the antennal pedicel somewhat longer, the proximal third of the wing naked with the exception of a single line of discal cilia under the marginal vein and the oblique (disto-caudad) limiting line running from the base of that vein and joining the proximal end of the line under the vein. The discal ciliation does not appear until at a point about half the length of the short marginal vein distad of the latter's apex. The marginal cilia of the fore wing are somewhat shorter and finer. Characteristics then are its coloration and the lack of discal ciliation under the venation; otherwise, it is similar to *darwini*. The mandibles are short, curved, acute and apparently edentate.

(From a single specimen, the same magnification.)

Male:—Not known.

Described from a single female specimen captured with the sweeping net in an open forest near Nelson, N.Q., January 24, 1912. Dedicated to Johann Wolfgang Goethe, poet, naturalist and monistic philosopher. Later at Nelson, September 5, 1912, I captured a second female, sweeping mixed jungle and forest growths along a streamlet. The distal half of the abdomen in this specimen was brown-black.

Habitat: Australia—Queensland (Nelson, near Cairns).

Type: No. *Hy/1044*, Queensland Museum, Brisbane, the above specimen on a slide in xylol-balsam (mounted with a homotype female specimen of *Aphelinoidea speciosissima* Girault).

11. GONATOCERUS SPINOZAI new species.

Female:—Length, 1.80 mm.; very large for the genus, larger than *davinci*.

Golden yellow, base of abdomen more or less obscurely, two stripes across dorsum of abdomen about the middle, exserted portion of sheath of the ovipositor, two round spots nearly in a longitudinal line near tip of abdomen along the side, two rather large, obscure areas separated at the median line on cephalic margin of scutum, lateral margin of scutellum, flagellum except distal margin of pedicel narrowly and base of the first funicle joint, two distal tarsal joints and venation dusky fuscous; scape the same but golden yellow ventrad and latero-ventrad. Eyes red. Wings hyaline. First abdominal stripe twice or thrice the length of the second. Femora and tibiæ suffused with more or less fuscous.

Differing from the preceding yellow species by its robustness and broad fore and posterior wings. Fore wings moderately broad, somewhat as in *hacckeli* but the marginal vein is long as in *davinci*; they bear about twenty-eight lines of discal cilia; these cilia are less dense than in *davinci*. The marginal cilia of the fore wing are very short cephalad, longest caudo-distad, there only moderately short, shorter than the caudal cilia of the posterior wing which are slightly shorter than the greatest width of those wings. At the apex of the fore wing the marginal cilia are short, only about half or less the length of the longest cilia farther caudad. Posterior wings broad but not widened especially across the apex of their venation, bearing at least six lines of discal ciliation, including those at the margins. This ciliation is not dense. The discal ciliation of the fore wing disappears before reaching the venation. Proximal tarsal joints of all legs long, as long or longer than the marginal vein. Strigil present. Abdomen ovate, the valves of the ovipositor exerted for a length equal to between a fifth and a sixth of its length, the yellow ovipositor long, inserted at base.

Antennae usual in number of joints, scape and pedicel but the funicle unusual because of the general equality of most of the joints. Pedicel subequal to the second funicle joint. Proximal funicle joint very small, wider than long, not a third the length of the second; succeeding joints cylindrical ovate, longer than wide and more or less alike. However, joints 2 and 8 are about shortest, 3-5 longest, each about a fourth longer than 2, distinctly longer than the pedicel; 5 somewhat the largest, about one and a quarter times longer than wide; joints 6 and 7 subequal, each only slightly longer than 8. Club long. Pubescence of antenna short, white, the funicle and club joints with what appear to be short, white longitudinal sulci, often curved and joining.

(From one specimen, the same magnification.)

Male:—Not known.

Described from a female specimen captured by sweeping along the sides of a footpath, through a forest near Nelson, N.Q., February 16, 1912 (A. M. Lea and A.A.G.). This magnificent species is characterised by its comparatively great size and robustness, its beautiful color pattern, its moderately broad fore wings, its long and slender marginal vein and proximal tarsal joint, the broad posterior wings and the great disproportion in size between the first and second funicle joints.

Dedicated to the profound student and thinker, Baruch Spinoza, who in the seventeenth century introduced the monistic conception of matter, "the loftiest, profoundest, and truest thought of all ages."

Habitat: Australia—Queensland (Nelson, near Cairns).

Typ: No. *Hy/1045*, Queensland Museum, Brisbane, the forementioned specimen in balsam.

12. GONATOCERUS BRUNOI new species.

Male:—Length, 0·80 mm.; moderate in size for the genus.

General color golden yellow, the distal half of the abdomen, the antennal flagellum (excluding pedicel), the venation, most of the dorsal aspect of thorax (broken, however, by yellow areas), the tarsi, the intermediate and caudal tibiæ and dorsal aspect of pedicel black. Wings stained, smoky nearly. Allied with *comptei*, *cingulatus* and the other golden yellow species with longer and narrower fore wings but distinguished from all of them in having the fore wings still broader, and the marginal vein long. Thus the fore wings bear about twenty-four longitudinal lines of discal cilia. Also the marginal cilia are coarser. Venation very distinct, long.

Antennæ longitudinally striate, the funicle joints gradually increasing in length but the club joint somewhat shorter; funicle joints about three and a half times longer than broad.

(From six specimens, the same magnification.)

Female:—Not known.

Described from six males captured at Nelson, N.Q., February 16, 1912 by sweeping along a forest path (A. M. Lea and A.A.G.). Dedicated to the monistic philosopher Giordano Bruno, who in the middle ages was a father of monism and a sound thinker at a time when most were under the combined influence of superstition and dogmatic religion.

Habitat: Australia—Nelson near Cairns, Queensland.

Types: No. Hy/1046, Queensland Museum, Brisbane, six males in xylol-balsam on a slide (with two females of *comptei*, and the type of *Oligosita anima* and three others).

13. GONATOCERUS HELMHOLTZII new species.

Female:—Length, 1·00 mm.; moderate in size for the genus.

Dark brown the base of the abdomen yellow; legs pale yellow but the caudal tibiæ brown, also the distal tarsal joints, the venation and the antennæ, excepting the sides of the scape and some of the pedicel obscurely, the exceptions yellowish. Wings hyaline. Coxæ concolorous with the legs. Mesoscutum margined with yellow.

Belonging to the group of allied species which includes *darwini*, *haeckeli*, *metchnikoffi*, *huxleyi* and *davinci* but similar only to the first two; from the last three it may be distinguished by its broader fore wings which bear very fine discal ciliation. From its nearest allies—*darwini* and *haeckeli*—it differs also in the same characteristic; the fore wings are broadly pyriform, the margin of the apex a straight line, the discal ciliation very dense and fine, the widest portion of the blade bearing about thirty-two lines, the marginal cilia short and fine around the apex, longest disto-caudad as usual but somewhat finer and

shorter there than is the case with *darwini* for example; the discal ciliation in the fore wing disappears a short distance distad of the apex of the marginal vein which is not lengthened. The posterior wings are moderately broad, acutely pointed, bearing five or six lines of fine discal ciliation distad (including the lines along the margin which are not distinctly differentiated), the caudal marginal cilia longer than the greatest width of the blade, but only slightly longer, distinctly longer than the mean width of the blade. Scape subequal to club; proximal two funicle joints subglobose, each much smaller than the pedicel, the fourth largest; funicle joint 5 longest of the funicle but only slightly longer on the average than joints 7 and 8, which are subequal; joints 5, 7 and 8 each longer than the pedicel; joint 6 of the funicle smaller, subequal in length to the pedicel or slightly shorter, proximal joints of the tarsi moderate in length. Abdomen conic-ovate, the ovipositor not exerted nor its valves.

(From four specimens, magnified as in preceding species.)

Male:—The same but the abdomen much smaller and ovate, the antennæ filiform and 13-jointed, the joints of the funicle and club longitudinally striate, the color of the whole lighter, the funicle joints all wider than long but variable in length, the proximal two and the club shortest.

(From three specimens, the same magnification.)

Described from three males and four females captured October 20 and 21, 1911 by sweeping the foliage of lantana and other trees in neglected fields near the town of Mackay, Queensland. One of the males had somewhat narrower wings and a short antennal pedicel. Subsequently, I captured a female at Hughenden, Q., by sweeping on the forest-downs, July 14, 1912. This was a small specimen.

Dedicated to Hermann Helmholtz, a man who aided in establishing the great principle of the conservation of energy in all substance.

Habitat: Queensland (Mackay and Hughenden).

Type: No. *Hy/1047*, Queensland Museum, Brisbane. The above males and females mounted together on a slide in xylol-balsam.

14. GONATOCERUS HUYGHENSI new species.

Female:—Length, 0.84 mm.

Brown-black, the abdomen brown, the legs and antennæ concolorous excepting sides of the scape and the knees, trochanters and more obscurely, tips of the tarsi, which are pallid. Venation brown. Wings hyaline. Cephalic tibiæ suffused with pallid.

Belongs in the group with *helmholtzii*. From the latter it differs in having all the legs dark, the fore wings narrower, the posterior wings with longer caudal marginal cilia, funicle joints 5 and 7 longer, subequal, each twice longer than wide and each longer than funicle joint 8. From *metchnikoffi* it may be at once distinguished by reason of the much coarser discal ciliation of the fore wing in that species and in having the distal four joints of the funicle much less unequal in length. From *davinci*, in being differently colored, in having a short marginal vein in the fore wing and a longer fifth funicle joint. From *huxleyi*, in lacking the discal ciliation under the venation of the fore wing, in having the proximal joints of the funicle all shorter, the fifth and seventh joints longer and the legs all dark. From *haeckeli* and *darwinii* in bearing the longer fifth and seventh funicle joints and from the former in having the legs dark.

(From a single specimen, the same magnification.)

Male:—Not known.

Described from a single female specimen captured by sweeping in a jungle near Kuranda, N.Q., November 4, 1911. Dedicated to Huyghens who discovered the vibratory principle of light.

Habitat: Australia—Queensland (Kuranda).

Type: No. Hy/1048, Queensland Museum, Brisbane, the foregoing female mounted in xylol-balsam.

The following table will aid in identifying the foregoing species; since the males agree structurally and colorationally with the females, excepting as concerns the secondary sexual characters, it should serve as well for that sex.

DIAGNOSIS OF THE AUSTRALIAN SPECIES OF *GONATOCERUS* NEES.
FEMALES.

Ovipositor not distinctly exerted nor its valves, rarely subexserted; antennæ with the funicle joints uneven, at least two much smaller than the others. No broad black stripe across the middle of the abdomen.

- I. Species brownish or brownish black, the fore wings broader, more or less oblately rounded at apex or subtruncate there, not narrower and of the graceful type. Yellow or dusky yellow or golden yellow (with one exception—*goethei*) not the predominating color, present only on the thorax, the appendages or base of abdomen. First four funicle joints always each shorter than the pedicel. Marginal cilia always distinctly less than a third the greatest width of the fore wing.
 - A. Fore wings very broad, almost squarely truncate at extreme apex, the discal ciliation very dense and fine, about thirty-two, more or less lines. Posterior wings with five or six lines of discal ciliation, at least distad (inclusive of the lines at the margins; excluding *davinci*).

- Base of abdomen, legs except distal tarsal joints and caudal tibiae, sides of scape and pedicel obscurely, pale yellowish; wings hyaline; mesoscutum margined with yellowish. Proximal four funicle joints small and subglobose, the fifth joint abruptly longer, thrice the size of the fourth. Brown, moderate in size. Fore wings shorter and broader. *helmholtzii* Girault.
- The same but the fore wings more slender, the fifth joint of the funicle not quite twice the length of the fourth, the proximal four funicle joints all longer than wide; mesoscutum apparently not marked with yellowish. *huxleyi* Girault.
- The same as *huxleyi* but the thorax over the cephalic coxae is yellow, the marginal vein longer, the distal two or three tarsal joints blackish; more robust *davinci* Girault.
- b. Fore wings narrower, the discal ciliation varying from fine to coarse, from twenty-five to fifteen lines across the widest portion of the fore wing.
- Discal cilia of fore wing moderately coarse or not dense, only about fifteen lines.
- Base of abdomen only narrowly pallid, also scape and pedicel, proximal half of caudal tibiae, distal half of cephalic femora and four first tarsal joints. Brownish black, wings hyaline. Proximal four funicle joints subequal, more or less globose and small, the distal four subequal, a half longer than the pedicel and each twice longer than funicle joint 4. Ovipositor not exerted *metchnikoffi* Girault
- Discal cilia of fore wing fine, dense, from twenty-three to twenty-six lines.
- All of body pale golden yellow, excepting dorsal aspect of the thorax, head, flagellum, caudal tibia, venation and two distal tarsal joints; also tip of the abdomen dorsad.
- Fifth funicle joint longest *goethei* Girault.
- Body mostly brown or brown-black.
- Discal ciliation absent under the marginal vein; marginal cilia shorter. Ovipositor subexserted.
- Legs and antennae nearly all dusky; fifth funicle joint about twice longer than wide, plainly longer than the distal joint *huyghensi* Girault.
- Legs and scape of antennae nearly all pallid; fifth funicle joint of antennae about only one and a quarter times longer than wide, only very slightly longer than the distal joint or subequal to it *haeckeli* Girault.
- Discal ciliation present under the marginal vein; marginal cilia longer; ovipositor just reaching to tip of abdomen.
- Legs pallid, marked with dusky; fifth funicle joint one and a half times longer than broad, slightly longer than the distal joint *darwinii* Girault.

II. Species bright golden yellow, marked with black, yellow the predominating color; fore wings narrower, graceful, their tips convexly rounded or obtusely pointed, their marginal cilia always distinctly longer than a third of the greatest width of the blade; first four funicle joints not always shorter than the pedicel.

- a. Fore wings narrower, slender, the blade narrowing proximad (out from the venation) like the handle of a paddle, with about fifteen lines of discal cilia across the widest blade portion; longest marginal cilia about two thirds the greatest width of the wing.

Pronotum, distal half of abdomen and the metathorax obscurely, black; head partly dusky; legs, scape and pedicel pallid yellowish, marked with dusky (male)..

baconi Girault.

- b. Fore wings broader, still graceful but not noticeably narrowed proximad, bearing about eighteen lines of discal cilia across the widest part of the blade.

Second and third funicle joints longest, much longer than the following joints of the funicle; thus the third joint is twice longer than joint 6.

Bright golden yellow (sometimes reddish), marked with black spots on the thorax dorsad; distal half of abdomen black and the head obscurely; marginal vein lengthened. Funicle joints 4 and 5 shortest

comptei Girault.

Second and third funicle joints not longest, distinctly shorter than some of the following joints, at least; joint 3 of the funicle somewhat shorter than joint 6.

The distal two funicle joints longest; marginal vein normal in length.

Dusky golden yellow

lamarcki Girault.

The fifth funicle joint longest or subequal to the following; marginal vein lengthened.

Bright golden yellow, marked somewhat as in *comptei*. Scape with its bulla slightly longer than the club

cingulatus Perkins.

- c. Fore wings still broader, bearing about twenty-five lines of discal cilia across their widest portion; marginal vein lengthened.

Distal half of abdomen, funicle, club, most of the thorax dorsad, tarsi and the two hind tibiae black, wings stained

brunoi Girault.

The valves of the ovipositor exerted for a length equal to about a fifth that of the abdomen; antennæ with only the proximal funicle joint much smaller than the others. A broad black stripe across middle of abdomen. Very large.

Bright golden yellow, the antennæ deep black, excepting sides of scape ventrad; joints of funicle, except the first, all rectangular to subquadrate, subequal in width; both wings broad but graceful. Beautiful

spinozai Girault.

SUBFAMILY MYMARINÆ Howard.

TRIBE ANAPHINI.

GENUS ANAPHES Haliday.

All in normal position.

The following species (*wallacei*) being black and bearing comparatively broad and less graceful fore wings is arranged with this genus rather than with *Anagrus* Haliday.

1. **ANAPHES WALLACEI** new species.

Female:—Length, 0.70 mm.; moderate in size to moderately small for the genus; slender.

General color deep black; base of abdomen, trochanters, knees, all of tibiae excepting two rings of black at the middle of each half respectively (the tibiae thus more or less distinctly banded with black, more noticeably and distinct in the posterior tibiae), all of tarsi except the distal joint, pallid or whitish. Wings hyaline, excepting under the submarginal vein in the fore wing which is dusky. Venation dusky; distal half of antennal pedicel pallid. Coxae concolorous with the body.

Belongs to the group of species represented by *cinctiventris* Girault, *gracilis* Howard, *goochi* (Enock) and *agilis* (Enock). By comparing it with specimens of the two latter it was observed to differ as follows: From *goochi* (Enock), which resembles *gracilis* and *cinctiventris* more and this species less than does *agilis*, it may be distinguished by reason of the fact that the funicle joints are all longer and cylindrical in *wallacei* and the fore wings narrower. Thus, the habitus is entirely distinct from the three species just named and *wallacei* in reality more nearly resembles *agilis* whose habitus is very similar to it. Besides the minor colorational differences, *wallacei* differs structurally in having the first funicle joint a third shorter, distinctly shorter than the pedicel and not much more than half the length of either the second or third joints; in *agilis* the three proximal funicle joints are subequal in length, the proximal joint somewhat the longest; funicle joints 4 and 5 are subequal in the Australian species, 6 decreasing slightly in length, joint 6 the shortest of the three; in *agilis*, joint 5 is distinctly shorter than either 4 or 6, joint 4 being the longest funicle joint and joint 6 the next longest; in *wallacei* joints 4 and 5 are the longest joints but neither is more than slightly longer than joint 4 (sometimes 2 and 3 are the longest). The fore wings bear much less discal ciliation, especially proximad and the marginal vein is distinctly curved toward its apex forming a footlike termination much like that found in *Stethynium*. In the English species, the marginal vein terminates in an obtuse point.

Discal ciliation of the fore wing confined mostly to the outer half of the wing where it is moderately fine and dense, arranged in about nine longitudinal lines, only one of which extends far proximad to the venation; this is about the third line which extends proximad near the cephalic margin nearly to the apex of the marginal vein. Marginal cilia of fore wing moderately long, at apex shorter than the preceding and following cilia, the longest about seven eighths of the greatest wing width. Posterior wings slightly broader than usual, bearing a paired line of discal ciliation along each margin and distad from the apex a third short line of about half dozen cilia; discal ciliation disappears after leaving the distal half of the wing. Marginal cilia of caudal wings usual, those of the caudal margin moderate, distinctly longer than the marginal cilia of the fore wing at the apex and distinctly shorter than the longest marginal cilia of the fore wing, about somewhat over twice the length of the average width of the blade of the posterior wing. Strigil present. Antennal scape long and slender, much longer than the club which is only about equal to the first two funicle joints combined. Proximal tarsal joints much the longest of the four. Valves of the ovipositor projecting slightly beyond apex of the abdomen but not exerted.

(From two specimens, 2/3-inch objective, 1-inch optic, Bausch and Lomb.)

Male:—Unknown.

Described from two female specimens mounted in balsam, captured October 6, 1911 from the window of a barn on a wheat farm, Roma, Queensland and on December 7, 1911 from the window of quarters for men on a sugar farm near Nelson (Cairns), N.Q. Respectfully dedicated to Alfred Russel Wallace.

Habitat: Queensland (Roma and Nelson).

Type: No. Hy/1063, Queensland Museum, Brisbane, one female on a slide (Nelson, December 7, 1911).

2. *ANAPHES KANTII* new species.

Female:—Length, 0.50 mm.; small for the genus.

General color dusky black, marked with pale canary or lemon yellow; the caudal half of the scutum, a large spot along each side of the thorax involving the insertions of both wings, somewhat over a third of the abdomen at base and all of the legs, excepting a spot above on the posterior femora, canary or light lemon yellow, the antennæ and venation greyish or dusky; eyes bright garnet. Wings hyaline except some duskiness at base. The spot on caudal femora is dusky black.

At once differing from the preceding species by having short funicle joints in the antennæ. In habitus, like *gracilis* Howard but differing from that species in having the conspicuous yellow on the thorax, in bearing more discal ciliation in the posterior wing (a total of two lines, along the cephalic margin) but otherwise evidently very similar.

(From a single specimen, the same magnification.)

Male:—Unknown.

Described at first from a single female specimen mounted in balsam and captured from a window, Yungaburra, N.Q., December 30, 1911 (A.A.G.). Subsequently, a second female specimen was found, captured at Tolga, N.Q., December 28, 1911, from a window, and a third was captured April 22, 1912, at Nelson from a window.

Habitat: Australia—Queensland (Tolga, Nelson and Yungaburra).

Type: No. Hy/1064, Queensland Museum, Brisbane, 1 ♀, Yungaburra (with a female of *Aphelinoidea*).

Dedicated to Immanuel Kant for his *The General Natural History and Theory of the Heavens*.

3. ANAPHES PAINEI new species.

Female:—Length, 0.55 mm.

Black, the basal half of the abdomen and the middle part (cephalad of middle) of the thorax orange-yellow, the legs dusky, the antennæ still more so; wings hyaline or nearly.

Like the preceding species, *kantii* but the body colors are deeper and more intense, the legs and antennæ darker; the discal ciliation of the fore wing is much more distinct, arranged in about ten or eleven lines, disappearing along each margin when the venation is reached but in the midlongitudinal line much sooner, at the distal three fourths of the wing; thus across the distal fourth the ciliation is uniform, dividing then and proceeding in a straight-margined oblique line to a point on each margin opposite to the apex of the venation. Therefore, there is in the middle line of the blade longitudinally a long wedge-shaped naked area. The posterior wings bear a paired line of discal ciliation along the caudal margin; this is additional to the cephalic paired line. The distal funicle joint of the antennæ is somewhat longer than in the preceding species. Marginal cilia of the fore wing very long, the longest about equal to the greatest wing width and subequal in length to the caudal marginal cilia of the posterior wing. The fore wing is somewhat more slender than in the preceding species.

(From a single specimen, the same magnification.)

Male:—Not known.

Described from a single female captured on the pane of a window, March 6, 1912. Thursday Island, Torres Strait, N.Q., Australia. Dedicated to Thomas Paine.

Habitat: Australia—Queensland (Thursday Island).

Type: No. Hy/1065, Queensland Museum, Brisbane, the foregoing species in xylol-balsam.

4. ANAPHES LAPLACEI new species.

Female:—Length, 1.50 mm. Body long and slender, resembling that of a thrips.

Deep glossy black, the trochanters, knees and tips of femora, a wide ring around the tibiae between base and middle, tips of tibiae broadly, the long proximal joint of tarsi (especially the posterior tarsi) and the apex of the antennal pedicel narrowly, whitish yellow; coxæ concolorous with body, eyes dark garnet; venation dusky blackish; suture along side of abdomen narrowly, more or less whitish. Wings subhyaline to hyaline, no distinct fumation.

Like the species *wallacei* in structure but differing in that the antennae and abdomen are longer, more especially the latter which is distinctly longer than the combined length of the head and thorax. The fore and posterior wings each bear several more longitudinal lines of discal cilia, the proximal tarsal joints are longer and all of the antennal joints. Otherwise, very similar in all points to the species named. The thorax has scaly sculpture.

(From three specimens, the same magnification.)

Male:—Not known.

Described from three female specimens captured by sweeping grasses on the forest-downs near Hughenden, Queensland, July 13 and 14, 1912. Several thrips were captured at the same time and this mymarid so closely resembled them that it was not at first recognised as being different. July 13 was cold for the tropics, cloudy and windy, the temperature about 65 deg. Fahrenheit.

Habitat: Australia—Hughenden, Queensland.

Types: No. Hy/1072, Queensland Museum, Brisbane, two females on a single slide in xylol-balsam (July 14, 1912).

The above species is dedicated to the great Laplace.

GENUS ANAPHOIDEA Girault.

All in normal position.

1. ANAPHOIDEA HARVEYI new species.

Female:—Length, 0.60 mm.; small for the genus. With a peculiar habitus for the genus. Black with a broad whitish band around base of abdomen. Scape serrate beneath, funicle joints of antenna irregularly unequal. Fore wings shaped as in *Stethynium*. Valves of the ovipositor slightly exerted.

General color deep velvety black; base of abdomen, venation, flagellum (pedicel plus funicle plus club) of antenna and all of legs pallid yellow, uniformly so. Wings hyaline. Scape dusky, nearly concolorous. Antennal club slightly suffused with dusky.

Fore wings shaped as is typical for the genus *Stethynium* Enoch, the marginal ciliation with the same arrangement, the longest cilia of the fore wing somewhat over half that wing's greatest width, the discal ciliation not dense, moderately fine and though the fore wings are moderately broad, they bear only about ten longitudinal lines of ciliation across their widest portion. Discal ciliation absent under the venation but there is a fine line of cilia running disto-caudad obliquely to the caudal wing margin from the centre of the marginal vein; the latter moderate in length, its upper margin bisinuate, convex at the middle and acute at apex. Caudal wings slender, with a paired line of discal cilia along each margin, without other discal ciliation excepting one or two cilia at extreme apex in the midlongitudinal line; its caudal marginal cilia nearly as long as the longest marginal cilia of the fore wing, distinctly twice the length of the rather short marginal cilia at the apex of the fore wing; but those of the cephalic margin of the caudal wing are not as long as the blade is wide, but nearly so. Caudal dilatation of fore wing very weak, barely indicated by a slight emargination.

Abdomen conic-ovate, somewhat shorter than the thorax, the valves of the ovipositor distinctly exerted but for no length, somewhat as in *Gonatocerus rivalis* Girault or as in the trichogrammatid genus *Neotrichogramma* Girault. Legs normal, the four tarsal joints moderately short, not differing greatly in length, the third about shortest; tibial spurs single, weakest on the intermediate tibiae, on the posterior legs nearly as long as the proximal tarsal joints, slenderer and longer on the cephalic legs there curved but apparently not forked and no strigil is formed. Mandibles weakly quadridentate, the two inner teeth weak, all teeth obtuse.

Antenna 10-jointed, the club obliquely divided. Scape moderately long, convex along the ventral margin and there showing some serration doubtless due to a sculpture like that of overlapping plates; pedicel small, gracefully enlarged distad and there truncate; funicle with the joints peculiarly, irregularly

unequal, joints 1, 2, 4 and 6 more or less alike and subequal, joints 3 and 5 long, the others short. Funicle joints 1 and 2 subequal, oval, not much longer than wide, 2 somewhat larger, neither as large as the pedicel; joint 3 abruptly longer, cylindrical, over twice longer than wide, twice the length of joint 2 and nearly twice the length of joint 4 which is ovate and slightly larger than 2, the largest of the short joints; joints 5 cylindrical ovate, shorter than 3 but broader, a third longer than 4 and nearly twice the length of 6 which is globular, subequal in length to 2 but broader. Joint 4 slightly shorter than the pedicel. Club conic-ovate, its proximal joint shorter, plainly less than half of its length. Club slightly longer than the three joints preceding (joints 4, 5 and 6 of the funicle). Pubescence of antenna thin.

(From one specimen, 2/3-inch objective, 1-inch optic, Bausch and Lomb.)

Male:—Unknown.

Described from a single female specimen captured from the pane of a window in workmen's quarters on a sugar farm near Nelson, N.Q., December 19, 1911. Dedicated to William Harvey who discovered through the use of his common sense the circulation of the blood in animals, at the time when individual thinking was prohibited and abhorred and individual experience thought to be worthless in research.

Habitat: Australia—Queensland (Nelson).

Type: No. Hy/1066, Queensland Museum, Brisbane, the forenoted female on a slide (mounted with the type female of *Alaptus newtoni* Girault).

If the club of the antenna of this species was 3-segmented, it would pass very well as a typical species of *Stethynium*; but one of exceptional color, being black. Thus it differs from the American and English species of the genus, forming all of its species, very much in habitus, as much as a typical *Anaphes* differs from a typical *Stethynium*; moreover it lacks the strong strigil present in the other species of its group. I cannot, however, consider the species generically distinct from *Anaphoidea* unless the absence of strigils, taken in conjunction with its different habitus should prove of sufficient value to form a good basis for it. Structural differentiation, it seems to me, should be the only basis for any such separation.

2. ANAPHOIDEA GALTONI new species.

Female:—Length, 0.75 mm.; moderately large for the genus, more robust.

General color deep black, the wings uniformly, lightly fumated throughout, the antennæ concolorous (pedicel lighter toward tip), the legs dusky, subpallid at the trochanters, knees and tips of tibiæ. Venation dusky. Habitus entirely distinct from that of the preceding species but agreeing with the North American and English species.

Differing from all the described species of the genus in having the fourth funicle joint distinctly shorter than either the third or fifth joints and having the second funicle joint slenderer and distinctly longer than the third joint, more than four times the length of the proximal funicle joint. Allied with *sordidata* but upon comparison found to differ as follows: In the antennal structure pointed out; otherwise practically the same. Parapsidal furrows complete; posterior wings with about seven cilia in the midlongitudinal line of discal ciliation. Antennæ 10-jointed, the club divided. Tarsi 4-jointed. Fourth funicle joint subequal in length to the pedicel; funicle 1 shortest, 4 next so but over twice the length of 1, joint 6 next shortest yet broadest of the funicle joints.

(From a single female specimen, the same magnification.)

Male:—Unknown.

Described from a single female specimen captured by sweeping miscellaneous vegetation along the outskirts of the town of Roma, Queensland, October 5, 1911 (A. A. Girault). Dedicated to Francis Galton who was a pioneer in the application of biological laws to human society.

Habitat: Australia—Roma, Queensland.

Type: No. Hy/1067, Queensland Museum, Brisbane, the above female.

3. ANAPHOIDEA LINNÆI new species.

Female:—Length, 0.53 mm.; moderate in size for the genus.

Black, the legs pallid yellowish, the antennæ black, the wings, except at base, distinctly, uniformly fumated throughout. Scape and pedicel of antenna suffused more or less with yellowish. Eyes dark garnet.

Fore wings slender and curved, shaped somewhat as in *Anagrus* but much broader, shaped more like those of *Anaphes sinipennis* but yet still broader and somewhat shorter, their longest marginal cilia slightly longer than their greatest width; fore wings bear about from eight to nine lines of discal cilia. Caudal wings also curved, with the white dots along the posterior margin, with the discal ciliation usual for the genus at each margin and with a short midlongitudinal line of from four to six cilia running from the apex. Antennæ 10-jointed, the club divided obliquely, the two joints about equal; shaped somewhat as in the North American *conotracheli*, the second joint slender, subequal to each of the following three joints which are wider; distal funicle joint distinctly shorter than either of the four preceding joints; proximal funicle joint subquadrate, not half the size of the pedicel nor more than somewhat over a fourth the length of the second or following joint. Pubescence of antenna short and

soft. Proximal joint of tarsi longest of the four tarsal joints, about thrice longer than wide. Either of joints 2-5 of the antennal funicle is longer than either of the two club-joints.

Distinguished at once from the other two Australian species by the curved fore wings bearing coarser ciliation; specifically from *galtoni* by the narrower fore wings and shorter antennal joints and colorless legs; in *galtoni* the fourth funicle joint almost abruptly narrows and shortens while the second funicle joint is longer than with *linnæi*; also the latter has pallid legs. From *harveyi*, this third species may be distinguished with great ease, since the former is entirely different in structure, the fore wings broad as in *Stethynium*, the abdomen more conical, the third funicle joint abruptly much longer than the globular second and the longer distal joint of the club; moreover, the coloration of *harveyi* is different.

As regards the North American species, *linnæi* is closer to *pullicrura*; from *sordidata* it differs in being smaller, in bearing shorter funicle joints, especially the narrower second joint and the wings are narrower; from *conotracheli* by the pallid legs and shorter antennal and tarsal joints. Otherwise it is surprisingly like the lastnamed species.

(From a single specimen, the same magnification.)

Male:—Not known.

Described from a single female specimen captured rather early in the morning (eight o'clock) from a window in a private residence at Nelson, N.Q., July 9, 1912.

Habitat: Australia—Nelson near Cairns, N.Q.

Type: No. Hy/1071, Queensland Museum, Brisbane, the above female in xylol-balsam.

GENUS ANAGRUS Haliday.

All in normal position.

1. ANAGRUS FREQUENS Perkins.

Perkins, 1905, pp. 190, 191, 193, 194, 198, 199, pl. XII, fig. 6. Id., 1906, i, xiv, xv, xxiv, xxxi. See statements beyond.

2. ANAGRUS LUTULENTUS Girault.

Girault 1911 a, pp. 135-137.

Perth, West Australia. Host unknown.

3. ANAGRUS BAERI new species.

Female:—Length, 0.43 mm.; moderately small for the genus; smaller than *brocheri* Schulz. Differing from the foregoing species (*frequens*) in coloration and antennal segmentation, the second funicle joint shorter than the third and sixth.

General color sooty or dusky or greyish, the thorax pallid yellowish as are the scape, pedicel and legs. Differing from *armatus* Ashmead, which, according to Perkins, agrees nearly structurally with *frequens*, in the following particulars: The fore wings have a more pronounced caudal dilatation and are distinctly broader on the average (about 7 longitudinal lines of discal ciliation) and the second funicle joint of the antennæ is distinctly shorter, shorter than the third and sixth. Of the North American species in antennal structure, *baeri* is closer to *epos* than to any other. But upon actual comparison of specimens the following differences are to be observed: The funicles of the antenna are similar in shape but in *baeri* the individual joints are shorter, the fore wings are similar in most arrangements but they differ in shape, the margins are more parallel in *epos* and in the latter the discal ciliation of the fore wing is longer, especially noticeable along the margin of the apex; specifically the caudal margin of the fore wing in *baeri* never becomes convex distad but in *epos* it becomes gently convex just at the widest portion of the blade. The differences between the two species are not abrupt, yet apparently actual, but it is a question whether or not they can be separated without actual comparison of the two. One should not be at all surprised to find them the same.

(From one specimen. 2/3-inch objective, 1-inch optic, Bausch and Lomb.)

Male:—Unknown.

Described from a single female specimen captured from the foliage of a wild, imported citron, growing near the jungle and infested with coccids and leafhoppers, Babinda, N.Q., October 29, 1911. Dedicated to Carl Ernest Baer the founder of embryology, who after Caspar Wolff, completely refuted the theories of scatology and preformation and brought ontogeny to a monistic basis.

Habitat: Australia—Babinda, Queensland.

Type: No. Hy/1049, Queensland Museum, Brisbane, Queensland, the foregoing female.

Some while after writing this section on *Anagrus* I captured at several points along the coast of North Queensland what I thought were undoubtedly specimens of *Anagrus frequens* Perkins. These were taken from windows; in an empty dwelling at Herberton, December 28, 1912, two females; in a carpenter's shop at Innisfail (Geraldton), January 11, 1912, one female; and from a window

in workmen's quarters on a sugar farm near Nelson, January 22, 1912, a female. The latter specimen stained xylol-balsam pink, having been mounted alive*; the first two had been in alcohol before being mounted. These specimens agreed in coloration, being yellow with three broad dusky stripes across the body from lateral aspect, one at the cephalic part of the thorax, one across the base of the abdomen, and one across the abdomen, not at but near the tip. They differ from the brief description of *frequens* given by Perkins in the following particulars: The proximal funicle joint of the antennæ is yellow like the scape and pedicel. The ovipositor is exerted distinctly but shortly. The fourth funicle joint of the antennæ is as wide as the fifth and sixth, not slender like the second and third joints as represented in the figure accompanying the original description. However, these differences might easily have happened through variation or by differences due to the mount of individual specimens. But there are other differences; the second funicle joint of the antenna is not so long as figured for *frequens* and as in the specimen of that species noted farther on in this section. It is less robust, the discal ciliation of the fore wing less conspicuous. For these reasons I had intended to rename these specimens, identifying another one captured later with *frequens*. The color in them is lemon-yellow, the legs, scape, pedicel and first joint of funicle being concolorous. I have since seen these specimens: Two females captured from a window in a shop in the little mining site of Rossville, N.Q., February 23, 1911. Another apparent difference between them and *frequens* is that in the former there is a tendency for one line of discal ciliation to be absent, the intermediate line from the cephalic margin. The scape, ovipositor and proximal tarsal joint of caudal legs are all somewhat longer in *frequens*. The color pattern of thorax and abdomen appears to be the same as in *frequens* and *Paranagrus*. The caudal tibiæ and tarsi may sometimes be dusky.

However, after much consideration, I believe the above specimens are all *frequens*. As regards the latter, I believe there can be no doubt but what I have correctly identified it in a female specimen captured from a window at Nelson, April 30, 1912. The specimen was stupefied with chloroform and mounted alive in xylol-balsam which it stained in the immediate site of its body a deep pink. The color pattern on the thorax is the same as that of *Paranagrus perforator* and I noticed that the two adjacent spots on the mesonotum became fused after the specimen had been mounted. I quite agree with Perkins when he states regarding *armatus* Ashmead "apparently almost identical with the preceding in form and structure," the word "preceding" referring to *frequens*. He has stated also "*Anagrus frequens*, under which name are probably more than one species, or at least one or two distinct races of a single species" and has pointed out the characteristic of *frequens*

* April 30, 1912, all pinkness in the mount had disappeared, the specimen pale lemon, marked as described. It was probably faint, the pinkness.

as compared with *armatus*; but this characteristic at the best is obscure since some specimens of *armatus*, mutilated perhaps, may possess it. It behooves us, therefore, to make a careful comparison of this species with the North American *armatus* Ashmead, its ally, *spiritus* Girault and the European *Anagrus brocheri* Schulz. As concerns *armatus* there are certainly no discernible differences except those stated and certain thoracic structures—the scutellum of *frequens* is longer at the median line, its cephalic margin more convex, its greatest length distinctly longer than that of the smaller triangular sclerites following (caudad), whereas in *armatus*, the scutellum is wider and flatter, its greatest length distinctly shorter than the length of the following paired sclerites. But I find later, that this character varies considerably in *armatus* and cannot be used for distinguishing purposes. The color pattern of *armatus* is like that of *frequens* sometimes but there may occur nearly immaculate specimens and ones with the abdomen entirely black. The scape is finely serrulate along its ventral margin in both species. In fact, the two are not separable at all and I therefore conclude them to be the same. Like all widely distributed species, *armatus* is very variable, its color extremely so, its fore wings vary much in width, comparatively speaking and the antennæ also somewhat but the relation of the joints remain about the same; the length to which the ovipositor is exerted also varies according to the position of the mount. Gross appearances, experience teaches us, will be found as useful in separating species of this genus as in any other and profound subtleties and refinements will only lead to involved difficulties in the great majority of cases.

As regards the North American species *spiritus*, a close ally of *armatus* and a species whose identity has puzzled me considerably (even though described by myself), I must conclude that as with *frequens* I am unable to separate it from *armatus* with which it must be considered identical. The naked area in the fore wings in any of these *ci-devant* species is too variable for a specific character; it is very seldom clearly delimited and to separate species on it alone would be like attempting to distinguish the leaves from the same tree so that they would always fall into distinct groups. We must include *armatus* (= *columbi* Perkins), *frequens* Perkins and *spiritus* Girault in the same category and conclude that *armatus* occurs in Australia. Incidentally it may be mentioned that *spiritus* was separated from *armatus* on the same supposed characteristic as was *frequens*; but also, it has broader fore wings and I now pronounce it a variety of *armatus*.

This brings us to the European species resembling *armatus*, namely *incarnatus* Haliday and *brocheri* Schulz. I have re-examined a female specimen of *brocheri* and it seems obviously distinct though it is difficult to point out just its characteristics. However, the brownness of its whole body (there being no yellow) is one and a peculiarity of the fore wings, which seem to be stiffer

both in regard to shape and ciliation, the discal cilia erect, distributed uniformly, a second. As regard *incarnatus*, I also believe that it is distinct, as I once separated it from *spiritus*. But, having once done this, does not relieve the suspicion with which *armatus* must be viewed when *incarnatus* presents itself. The species *armatus* is thus subcosmopolitan. I recapitulate its history for convenience, herewith:

ANAGRUS ARMATUS (Ashmead).

Litus armatus Ashmead, 1887, p. 193.

Eustochus xanthothorax Ashmead, ib., pp. 193-194.

Anagrus frequens Perkins, 1905, p. 198, pls. XII, fig. 6; XIII, fig. 8. (See above).

Anagrus columbi Perkins, 1905, pp. 193, 194 and 198, pls. XII, fig. 6; XIII, fig. 8a. id., 1906, pp. i, xxiv, xxxi.

Anagrus spiritus Girault, 1911 b, pp. 207-210.

Anagrus armatus (Ashmead)—Girault, 1911 c, pp. 289-292.

Synonyms: *Eustochus xanthothorax* Ashmead; *Anagrus frequens* Perkins; *Anagrus columbi* Perkins; *Anagrus spiritus* Girault.

Varieties: *nigriventris* Girault.

spiritus Girault.

australiensis Girault, novum.

Habitat: North America—United States (Florida, Ohio, Illinois, Maryland, Colorado, New York, and Iowa). Australia—North Queensland (Herberton, Innisfail, Nelson near Cairns and Rossville near Cooktown). Fiji—Suva. Sandwich Islands—Oahu at least.

The Fijian specimen I captured myself at Suva, September 22, 1911, on a window in a livery stable. It was nearly uniformly yellow in colour. The following specimens should also be recorded: A female captured at Nelson, N.Q., with a female of *Paranagrus perforator* on a window of a building on a sugar farm (April 20, 1912). In the original description of *frequens*, Perkins had stated: "An apparently different race inhabits Fiji, but I cannot separate it specifically."

In regard to variation in *armatus*. It should be mentioned that the distal three funicle joints of the antenna are sometimes much shorter than usual, which gives the appearance of being characteristic. Also that the Queensland specimens are usually but not always marked with the moderately broad black stripes across the body, as seen from lateral aspect, one across the cephalic end of the thorax, one across the abdomen and one across the latter's tip. This appears to be so characteristic that I hereby name specimens so marked as the new variety *australiensis*.

Type of variety *australiensis*: No. Hy/1050, Queensland Museum, Brisbane, 1♀ in xylol-balsam (Nelson, N.Q., April 30, 1912).

Subsequently at Nelson, N.Q., I captured single females of this species from windows on August 3 and September 2, 1912; they were both the variety *australiensis*.

GENUS PARANAGRUS Perkins.

For the present, I accept this as a distinct segregate of generic value, but doubtless it will finally be classed as a subgenus. The longer proximal funicle joint is its only characteristic, excepting a greater slenderness and apparently a characteristic color pattern on the thorax and in the discal ciliation of the fore wing (minors).

1. PARANAGRUS OPTABILIS Perkins.

Perkins, 1905, pp. 188-190, 191, 193, 194 and 199, pls. XII, figs. 1 and 2; XIII, figs. 3, 4, 5, and 5a; Idem, 1906, pp. x, xi, xiv, xv, xvi, xxiv, xxix and xxxi.

“*Hab.*: Queensland; bred in all localities from the eggs of *Perkinsiella saccharicida*. A very similar form inhabits Fiji, but the material is insufficient to determine whether they are specifically identical.” I have not taken this species in Queensland.

2. PARANAGRUS PERFORATOR Perkins.

Perkins, 1905, pp. 191, 193, 194, 199. *Ib.*, 1906, pp. xiv, xv, xvi, xxiv and xxxi.

Female:—A specimen agreeing in color pattern with *perforator* Perkins and in general coloration orange-red, turning in balsam to a beautiful pink, also staining the surrounding medium the same color. It differs from the original description of *perforator* not at all but the antennal and wing characters are not given in the description. But it agrees with the original description of *optabilis* with the exception of its general coloration and the exerted ovipositor. Its antennæ agree with the figures given of *optabilis* by Perkins (i.e.) as do also the wings and tarsi. The fore wings are very slender and curved, with very long marginal cilia and with one long midlongitudinal line of discal cilia, proximad reaching to the end of the venation; also, at the apex of each side of this line there are two (cephalad) and one (caudad) short lines of cilia, the mesal one of the two cephalic lines, longer; there is also a paired line of discal ciliation along each margin of the blade. The narrow, straight posterior wing bears a paired line of discal cilia along the caudal margin (not close together) and a single line along the cephalic margin. Strigil present. The male is not known. The species originally was described from Fiji, reared from the eggs of delphacid leafhoppers of different genera. The valves of the ovipositor are exerted for a length equal to the three basal joints of the hind tarsus.

The foregoing notes were made by examining a single female specimen captured at Nelson (near Cairns), N.Q., April 20, 1912, from a window in men's quarters on a sugar farm. It was stupefied with chloroform and mounted then in xylol-balsam. There can be but little doubt that the specimen is correctly identified. On May 18, 1912, another female was captured in the same place. By that date, the first specimen had become in balsam a dull honey-yellow, but a pink cloud still surrounded the body. In neither specimen were the valves of the ovipositor exerted for a length greater than the combined length of the first three joints of the posterior tarsus. From the same window, a female was captured on June 14 and 20, 1912.

GENUS STETHYNIUM Enoch.

All in normal position.

1. STETHYNIUM DALTONI new species.

Female:—Length, 0.75 mm.; moderate in size for the genus.

General color pinkish yellow, light yellow suffused with pinkish, the antennal funicle and club and all distal tarsal joints smoky brown or dusky. Venation concolorous with the body or somewhat darker. Wings hyaline. Eyes and ocelli ruby-red. Pronotum and extreme tips of abdomen dusky.

Closely allied with the American *faunum* Girault and the English *triclavatum* Enoch by bearing normal posterior wings but differing from the former in bearing moderately narrow fore wings (only about twelve longitudinal lines of discal ciliation at the widest blade portion) which are not so characteristically shaped and more obtuse at apex. From the American species in having the second funicle joint of the antennæ shorter. The marginal cilia of the fore wing are nearly as long at the apex of the wing as they are along the cephalic margin where the longest are between a third and a half of the greatest wing width. The venation of the fore wing is characteristically shaped, as in *triclavatum*. The caudal wings bear a paired line of discal cilia along each margin and its marginal cilia at the cephalic margin are about as long as the blade's greatest width. Tarsal claws all moderate in length. Discal ciliation of the fore wing moderately fine, not very dense.

Antennæ 11-jointed, distinctly clubbed, the club 3-jointed, the joints all of subequal length, the region conic-ovate and as long as the distal four funicle joints combined. Scape not much longer than the pedicel, while the latter is only slightly longer than the proximal funicle joint; all funicle joints excepting 5, longer than wide, 2 longest, $2\frac{1}{4}$ times longer than wide; 1 and 3 subequal, a fourth shorter than 2; 4 still shorter and somewhat broader, oval; 6 somewhat larger than 4; joint 5 smallest subhemispherical, wider than long. Club joints each subequal to the pedicel. Pubescence of funicle scraggly and thin.

(From one specimen, 1/6-inch objective, 2-inch optic, Bausch and Lomb.)

Male:—Unknown.

Described from a single female specimen captured from the pane of a window in a barn, State Farm, Roma, Queensland, October 6, 1911 (A.A.G.). Dedicated to the discoverer of the atomic theory in chemistry.

Habitat: Australia—Queensland (Roma).

Type: No. Hy/1056, Queensland Museum, Brisbane, 1 female in xylol-balsam (mounted with a female of *Oligosita americana* Ashmead).

2. *STETHYNIUM MAYERI* new species.

Female:—Length, 0.80 mm.

General color uniformly lemon-yellow, the legs concolorous, the antennal club and distal four funicle joints dusky, the eyes and ocelli bright red; distal tarsal joints concolorous with the legs and body; fore wings hyaline but with a slight suffusion of duskiness proximad. Venation concolorous. Ocelli in a triangle in the centre of the vertex, the lateral ocelli elliptical, distant from the eye margins, each closer to the cephalic ocellus than to the other. Fore wings moderately narrow, bearing about twelve longitudinal lines of discal ciliation, the latter moderate; the longest marginal cilia of the fore wing are slightly over three fourths its greatest width but at the cephalic margin at apex only about a fourth of the wing's greatest width, shortest at the apex, here not half the length of the cilia along the caudal margin of the posterior wing and abruptly shorter than the longer cilia disto-caudad. Posterior wings narrow, acuminate, curved like a sabre, their marginal cilia at the caudal margin about twice longer than the blade's greatest width, those of the cephalic margin somewhat longer than the blade is wide but not half the length of the caudal cilia. Discal ciliation of the posterior wing absent excepting a paired line along each margin and a short midlongitudinal line of about 5-6 cilia running from the apex between the lateral lines. Fore wing obtusely pointed and with the peculiar arrangement of the discal cilia and the peculiarly shaped venation. Parapsidal furrows complete. Eyes naked. Tarsi 4-jointed, the joints all moderately long and subequal, shortening somewhat distad; strigil present. Vertexal carina present. Abdomen sessile, conic-ovate, subequal to the thorax in length, the ovipositor not exerted.

Antennæ 11-jointed, characteristic because of the unequalness of the funicle joints. Scape about twice the length of the pedicel, subcylindrical, longest. Pedicel slightly shorter than the first funicle joint; first three funicle joints cylindrical, 2 distinctly longest of the three, 1 shortest, slightly shorter than 3; funicle joint 4 is slightly shorter than 1 whereas joint 5 is distinctly longer and stouter, as long as 2 and stouter than it, cylindrical-ovate; the distal

joint (6) abruptly shortened, about half the length of 5 and the smallest antennal joint; here, from joint 3 of the funicle, we have alternately long and short joints. Club conic-ovate, its intermediate joint shortest, its proximal joint longest, slightly longer than the cone-shaped terminal joint; the club is longer than the three distal funicle joints combined and longer than the scape. Pubescence of antenna short, moderate.

(From one specimen, 2/3-inch objective, 1-inch optic, Bausch and Lomb.)

Male:—Unknown.

Described from a single female specimen captured while crawling over the foliage of *Eucalyptus* in a forest, Nelson, Queensland, November 19, 1911.

Habitat: Australia—Queensland (Nelson, Cairns District).

Type: No. Hy/1057, Queensland Museum, Brisbane, Queensland, the foregoing female on a slide in xylol-balsam.

This species differs from *daltoni* in having the distal tarsal joints, tip of abdomen and the proximal funicle joints of the antennæ concolorous and being a shade different in general coloration. Structurally its antennæ are very different; for instance, funicle joint 5 is shortest in *daltoni* but nearly the largest in *mayeri*; none of the joints are wider than long in *mayeri*; in general, the funicle joints are all longer in *mayeri*. There are other differences which are pointed out in the table of species. From the American and English species it may be distinguished by its unequalness in the antennal funicle, the alternately long and short distal four joints. Respectfully dedicated to Robert Mayer, who with Hermann Helmholtz discovered the law of the conservation of energy.

3. STETHYNIUM LAVOISIERI new species.

Female:—Length, 0.68 mm.

General color dusky yellowish, the legs very pallid, contrasting, the antennæ concolorous. Fore wings hyaline, slightly clouded beneath venation. Caudal wings noticeably clear, translucent and white, immargined.

This species differs at once from the preceding two in being more characteristic of the type of the genus; its wings are broader, more densely ciliate and with the marginal ciliation arranged more characteristically; also at the caudal dilatation, the immargination is pronounced. It differs from *daltoni* structurally in just the points mentioned and from *mayeri* more so along the same lines, but more especially in antennal structure.

Fore wings moderately broad, broadest about midway between the end of the venation and the wing apex but very slightly pointed obtusely, its caudal

margin changing angle at the widest portion of the wing, the marginal cilia long, abruptly lengthened disto-caudad, the longest somewhat over three fourths the greatest wing width. Discal ciliation of the fore wing fine and dense, arranged in about seventeen longitudinal lines across the widest portion of the blade. Caudal wings perfectly white and translucent, their discal ciliation arranged in a paired line along the caudal margin, a single line along the cephalic margin and a short midlongitudinal line of four or five cilia, scattered from near the apex; all of the discal ciliation is colorless and nearly invisible. The caudal wings in this species are characteristic; they are broader than those of *daltoni* and not margined with dusky and hence not defined so well; their marginal cilia are longer and more conspicuous. Mandibles tridentate. Tarsi 4-jointed, the joints short; tip of ovipositor slightly exerted. Abdomen conic-ovate, subequal in length to the thorax.

(From three specimens, the same magnification.)

Male:—The same. Abdomen much shorter; antennæ 13-jointed, the flagellar joints longer than wide, longitudinally striate, the proximal and distal two joints of the funicle longest and subequal, the second funicle joint somewhat the longest.

(From one specimen, the same magnification.)

Described at first from three female specimens captured October 26, 1911 while crawling over the foliage of a species of *Eucalyptus* (bastard gum) infested with leafhoppers and probably parasitic on the eggs of some homopterous insect. A species characterised by the colorless legs and caudal wings, the shape of the latter and the fore wings and the ciliation of the latter. Subsequently the following specimens: In the same place as formerly, one female on November 29 and two on November 30, 1911; on the latter date also a male. A female at Herberton, N.Q., December 28, 1911 from a window in an empty dwelling.

Habitat: Australia—Queensland (Nelson and Herberton).

Type: No. *Hy/1058*, Queensland Museum, Brisbane, one female in xylol-balsam (Nelson, October 26, 1911).

Dedicated to the discoverer of the law of the conservation of matter.

4. *STETHYNIUM CUVIERI* new species.

Female:—Length, 0.30 mm.; minute for the genus and family. Visible to naked eye as a minute dot but not as small as species of *Alaptus*.

General color pallid lemon-yellow,* the abdomen suffused with dusky; eyes and ocelli ruby-red; antennæ and legs concolorous with the general body color or somewhat paler; wings hyaline.

* Color changes to orange in xylol-balsam.

A species characterised by its minuteness and the following characters: The fore wings are narrow, bearing only about ten longitudinal lines of discal ciliation, their longest marginal cilia distinctly longer than their greatest width, those at the apex of the wing are long; the wings themselves are more graceful than usual with the genus; the joints of the funicle of the antenna are all short and subquadrate, only the second, fourth and sixth longer than wide, the joints alternately smaller and larger; caudal wings with only three lines of discal ciliation. The species is more plainly characterised in the table of species following.

(From one specimen, 2/3-inch objective, 1-inch optic, Bausch and Lomb.)

Male:—Unknown.

Described from one female mounted in xylol-balsam and captured from a leaf of bastard gum in a forest, Nelson, N.Q., November 29, 1911.

Dedicated to Georges-Léopold-Chrétien Frédéric-Dagobert Cuvier, the great comparative anatomist.

Habitat:—Queensland (Nelson, Cairns District and Herberton).

Type:—No. *Hy/1059*, Queensland Museum, Brisbane, 1 female in xylol-balsam (mounted with a male of *Oligosita minima* Girault, Nelson November 29).

Subsequently a female from a window in an unoccupied dwelling, Herberton, N.Q., December 28, 1911; another at Nelson, December 22, 1911, from a window in men's quarters on a farm and one from the foliage of a bastard gum at Nelson, November 30, 1911; also a female from a window, Nelson, April 21, 1912.

5. *STETHYNIUM VESALII* new species.

Female:—Length, 0.50 mm.

The same as *lavoisieri* but the fore wings are narrower, also the posterior wings but yet still the same color. The general color is bright lemon-yellow, the legs and antennæ, excepting the concolorous scape, colorless like the posterior wings. The antennæ and fore wings are more nearly like those of *daltoni* but *vesalii* differs from the latter in not having the dusky antennal funicle, in bearing a longer distal club joint, joint 2 of the funicle shorter than in the other species yet longest, somewhat longer than wide and joint 5 longer than wide, but not much more so; the caudal wings bear longer cephalic marginal cilia, the fore wings a somewhat different outline; also the distal tarsal joints are pale, the blade of the fore wing more convex along the distal half of the caudal margin and apparently the sulci are absent on the scutellum (a median sulcus along the phragma). From *lavoisieri*, this species differs mostly in

bearing much narrower fore wings, though they are nearly the same shape. In *lavoisieri* the fore wings are nearly twice the width of those in *vesalii* while the funicle joints are all subglobular. It is most closely related to *cuvieri*, differing only in the broader fore wings (about fourteen longitudinal lines of discal cilia) which are slightly wider than or subequal in width to their longest marginal cilia. Thus, it appears to be a species intermediate between the minute species and *vesalii*. Its colorless and somewhat broader posterior wings, broader fore wings, greater size (over twice the size of the smallest species) and longer distal club joint are its characteristics when compared with *cuvieri*. It is the same size as *Oligosita minima* Girault.

(From seven specimens, the same magnification as for the preceding species.)

Male:—Not known.

Described from seven female specimens captured from the foliage of bastard gum in a forest near Nelson, N.Q., October 26, 1911, (1 ♀), November 30, 1911 (5 ♀'s); and from the window of a barn at Roma, Queensland, October 6, 1911 (1 ♀). Dedicated to Andreas Vesalius, one of the earliest men of the present civilisation to assert the right of free thought and independent mentality.

Subsequently, a female from a window at Nelson, April 21, 1912.

Habitat: Australia—Roma and Nelson near Cairns, Queensland.

Type: No. Hy/1060, Queensland Museum, Brisbane, one female in xylo-balsam (Nelson, November 30; mounted with a pair of *S. lavoisieri* and *S. cuvieri* and *Oligosita minima* Girault, 1 ♂, 1 ♀). This species may be *cuvieri*, large individuals.

6. STETHYNIUM PEREGRINUM Girault.

Girault, 1911 d, pp. 120-123. Perth, West Australia.

DIAGNOSTIC ARRANGEMENT OF THE AUSTRALIAN SPECIES OF *STETHYNIUM* ENOCK.

FEMALES.

A. Species all yellowish, the wings hyaline or at least not distinctly infuscated; the mesoscutellum bearing median and lateral sulci.

I. Fore wings narrow, their longest marginal cilia distinctly longer than their greatest width. Minute.

Fore wings at the most with about ten longitudinal lines of discal cilia; joints 2, 4 and 6 of antennal funicle longest, longer than wide, the other joints subquadrate, or only slightly longer than wide, all the funicle joints short; distal club joint forming nearly half of the club. Legs and antennae wholly concolorous with the body *cuvieri* Girault.

- II. Fore wings moderate to broad, their longest marginal cilia distinctly shorter than their greatest width or may be subequal. Species moderate in size to moderately large.
1. Posterior wings normal. Second funicle joint as long or longer than the pedicel.
 - a. Proximal funicle joints of antenna moderately long, the second joint much longer than the pedicel and plainly four times longer than wide. Distal four joints of funicle and whole of the club sooty black; distal tarsal joints concolorous with the legs; funicle joint 5 twice the size of joint 6 which is shorter than proximal funicle joint *mayeri* Girault.
 - b. Proximal funicle joints of antenna short, the second joint subequal in length to the pedicel and only about twice longer than wide. All of funicle joints and whole of the club sooty black; distal tarsal joints black; funicle joint 5 smaller than joint 6 of the funicle which is nearly as long as joint 1 and distinctly broader *daltoni* Girault.
 2. Posterior wings broader and unusually white, more or less abnormally broad; second funicle joint distinctly shorter than the pedicel.

Fore wings broad, bearing about seventeen lines of discal cilia at their widest portion; posterior wings broad and colorless, apparently without discal ciliation and immargined, the marginal cilia long. Dusky yellowish, the legs very pallid, the antennæ yellowish. Joints of funicle all subglobular *lavoisieri* Girault.

Fore wings not so broad, bearing only about twelve or fourteen longitudinal lines of discal cilia; posterior wings slightly broader than usual, colourless. Bright lemon-yellow *vesalii* Girault.
- B. Species Indian red, the fore wings more or less fumated under the venation and broad, bearing from thirty to thirty-five lines of discal cilia; sulci of thorax absent; posterior wings very broad, their posterior marginal cilia longer than those of the fore wing; second funicle joint only a third longer than wide *peregrinum* Girault.

TRIBE MYMARINI.

GENUS MYMAR Haliday.

All in normal position.

1. MYMAR SCHWANNI new species.

Female:—Length, 0.70 mm. Visible to naked eye but not easily though not small.

General color brown, the distal third of the abdomen dusky black or fuscous, the vertexal carina and eyes dark; abdominal petiole, distal two funicle joints, coxæ and femora lighter, with some yellowish, nearly pallid yellowish; scape, pedicel, the tibiæ and tarsi concolorous with the body; distal tarsal joints,

first four funicle joints and antennal club sooty black; petiole of fore wings and somewhat over the distal half of the wing blade dark sooty black, the remaining portion of the blade hyaline. The fuscation of the fore wings is intense.

This species as compared with a specimen of *Mymar pulchellum* Curtis, differs as follows: In general appearance, coloration and so forth casually the same. The details of coloration differ—the fourth funicle joint in *schwanni* is black, yellowish in *pulchellum*; in the former, the scape, pedicel, the tibiae and tarsi are darker than in the English species which has the legs of uniform color; the petiole of the fore wing and the vestigial posterior wing are darker in *schwanni* and the fuscation of the fore wing more intensely black. Structurally, in the antennae, which are very similar, the distal funicle joint in the Australian species is slightly shorter in relation to that in the preceding species and all of the funicle joints distad of the long second joint are somewhat longer, the two distal joints more nearly equal than in *pulchellum*. The fore wings of *schwanni* differ in that they are distinctly broader (at least by a third) and bear a higher number of primary marginal cilia (35 to 36; only from 28 to 30 in *pulchellum*); the discal ciliation is about the same yet somewhat coarser while the marginal cilia are somewhat longer (it is hairlike). The posterior wings in both species are about the same shape and size and in all other respects the two species appear to be the same. From the American species, *venustum* Girault, *schwanni* differs in bearing several more primary marginal cilia (only about 34 in *venustum*), the central line of discal cilia extends to the wing apex (here proximad, the acute part of the blade), the clouded portion of the fore wing is much darker and more intense and in details of coloration, especially as concerns the antennae which in *venustum* are uniformly colored, not black, brown and yellow as in this Australian species. In this connection it should be stated that the antenna of the male of *pulchellum* is also uniformly concolorous with the body, not yellow and black as in the female.

(From one specimen, 1/6-inch objective, 1-inch optic, Bausch and Lomb.)

Male:—Unknown.

Described from a single female specimen captured from the panes of a window in a wool warehouse, Brisbane, Queensland, October 3, 1911. The specimen was in active movement, its wings extended vertically over it and the insect was moving along rather slowly with an actual dancing movement which made it much more conspicuous than if it had been at rest. The wings were in rapid motion. On October 5, 1911, at Roma, Queensland, several hundred miles west of Brisbane, a male *Mymar* was captured by sweeping grass along a tiny stream crossing a pasture near the town. It looked like this same species, but although the specimen was preserved, later I could not find it.

Habitat: Australia—Queensland (Brisbane and (?) Roma).

Type: No. Hy/1061, Queensland Museum, Brisbane, the above female in xylol-balsam.

This species is respectfully dedicated to Theodore Schwann of Berlin, who discovered the animal cell and proved it to be identical with that of plants.

It was compared with a pair of the English species *pulchellum* Curtis, labelled "*Mymar pulchellum* Curtis, ♂, ♀. Richmond, England. 10.9.10. C. Waterhouse" and sent to me by its collector who identified it.

2. MYMAR TYNDALLI new species.

Female:—Length, 0.85 mm.; moderately large for the genus.

General color dusky black, the ventral aspect of the proximal half of the abdomen, all of that portion of the thorax cephalad of the first legs, abdominal petiole, coxæ, trochanters and cephalic femora dull honey yellow; rest of the legs and all of the antennæ sooty black; eyes dark; fore wings with slightly less than a half from apex pronouncedly clouded with sooty black, the proximal margin of the clouded area in the caudal half of the wing with a distinct scoop or concavity in it; petioles of the wings proximad suffused with yellowish. Bulbs of scape yellowish.

At once distinguished from all species of the genus known to me by having the posterior wings unusually long and hairlike, reaching beyond the base (caudad) of the small blade of the fore wing. Furthermore, distinguished from the specimen of *pulchellum* mentioned above by marked differences in coloration and in bearing a somewhat broader blade of the fore wing. From *schwanni*, *tyndalli* differs more noticeably, namely in bearing a narrower and more elongate blade of the fore wing (bearing about 41 primary marginal cilia, only about 35 in *schwanni*). Otherwise, structurally the three species are surprisingly similar. The posterior wing in *tyndalli* is like that of the other species along its thicker proximal fourth (out to the hooklets), but there it nearly abruptly narrows, becoming like a very long, hairlike seta arising from the apex of the thicker proximal portion; slightly distad of its distal fourth it again perceptibly narrows, becoming like an exceedingly fine hair which is acuminate; along the caudal margin of the blade of the fore wing, the posterior wing reaches slightly beyond the second primary marginal cilium. The proximal three fourths of the posterior wing, or all of it excepting the narrowest, delicate distal fourth (or less) bears along it from each side, minute hairlike setæ as with the petiole of the fore wings. Tarsal claws and strigil present. Hooklets on posterior wings.

(From one specimen, the same magnification.)

Male:—Unknown.

Described from a single female specimen captured from the pane of a window in workmen's quarters on a sugar farm near Nelson, N.Q., January 22, 1912, in the mid-afternoon.

Habitat: Australia—Queensland (Nelson).

Type: No. Hy/1062, Queensland Museum, Brisbane, the above female in xylol-balsam (mounted with a female of *Anagrus armatus*).

Dedicated to John Tyndall, natural philosopher.

There is a distinct possibility that the posterior wings in all species of *Mymar* are like those of *tyndalli*, the setiform portion having become broken off in the specimen described, as appears so likely to happen from its appearance. If this is so, coloration and the general characters of the blade of the fore wing appear to be the only details in which the species differ. Those species so far seen by me agree remarkably in antennal and leg structures and in the shape of the body and so on.

GENUS POLYNEMA Haliday.

All in normal position.

1. POLYNEMA REDUVIOLI Perkins.

Perkins, 1905, pp. 193, 194, 196-197. pls. XII, figs. 3 and 3a; XIII, fig. 7.

Idem, 1906, p. xxiv; 1910, p. 667.

The following comparative notes are given concerning this species:

General color black, the legs (excepting distal tarsal joints but including coxæ), the abdominal petiole and proximal three antennal joints intense orange-yellow. Wings hyaline, the venation black.

Second funicle joint somewhat diluted black.

Belonging to that group of species with the proximal funicle joint lengthened, usually with the scape asperate beneath and usually black, intensely colored with orange on the appendages and abdominal petiole. It resembles then the following species of the genus—*psecas* Girault, *enockii* Girault and *hawaiiense* Ashmead. From *psecas* and *enockii* it differs as follows: *enockii* has very much broader fore wings (only about 24 longitudinal lines in *reduviali*) with their marginal cilia shorter (the longest in *reduviali* somewhat over a third the greatest width of the wings); its proximal funicle joint is longer, subequal to joint 2, distinctly shorter but not very much so in *reduviali*; the third and fourth funicle joints are subequal in the English species, unequal and shorter in the Australian one; in the latter also the proximal funicle joint is only a fourth longer than joint 3, while in *enockii* it is a third longer. The two species

are readily distinguished, especially because of the differences in the width of the fore wings. From the American species *psecas* it differs only about as much as it does from *enockii*, both the American and English forms being closely related (but see later). From *hawaiiense*, apparently, it may be distinguished by its shorter proximal and third funicle joints of the antennæ. With the exceptions noted the species resembles *enockii* and elsewhere I have pointed out how closely allied it is to the North American *psecas*. Scape asperate along its ventral margin and with a very distinct scaly sculpture; pedicel oval, slightly over half the length of the first funicle joint; marginal vein of fore wing narrow. Posterior wing bearing a paired line of discal ciliation along each margin but apparently with no midlongitudinal short line running from the apex. Marginal cilia of the fore wing along the cephalic margin not half the length of the longest marginal cilia (caudo-distad). Longest marginal cilia of caudal wing about three fourths the length of the longest cilia of the fore wing. Discal ciliation of the fore wing dense and fine.

(From 1 specimen, 1-inch objective, 1-inch optic, Bausch and Lomb.)

Male:—I have noted the male elsewhere while Perkins described it in the original description of the species.

Redescribed from a single female specimen captured by myself November 4, 1911, from the window of a veranda in a private residence, Kuranda, Queensland.

Habitat: Australia—Queensland (Kuranda). Sandwich Islands.

I have since been able to compare this species with authentic specimens of *psecas* (Girault) and find the following differences: The second funicle joint in *psecas* may be nearly as yellow as the first, not merely dilute black; the proximal funicle joint is distinctly longer, thus it is slightly longer than the second, the first, second and third joints each shortening; the fore wings appear to be somewhat broader yet the two species are very similar in this respect. They must be separated on antennal structure. A recomparison of specimens of the British (*enockii*) and American (*psecas*) forms still induces me to consider them distinct; thus, as regards the length of the proximal funicle joint of the antenna, *psecas* comes first with that joint slightly though distinctly longer than the second, then *enockii* with the first slightly shorter than the second and then finally this Australian species (*reduvioli*) with the first joint distinctly shorter than the second. This structure of the first funicle joint of the antenna in *reduvioli* reveals another gradation between the short and usual proximal funicle joint and the long joint and strengthens the argument concerning the identity of *Stephanodes* Enoch with *Polynema* Haliday. Still another link in the gradation is the next species.

2. **POLYNEMA SPENCERI** new species.

Female:—Length, 0.77 mm.

Black, with the abdomen brownish black, the antennal pedicel, the scape to a less extent, the first funicle joint, the knees, cephalic tibiae, most of the intermediate and posterior tibiae excepting a band in the middle and the tarsi except distal joint, pallid yellow, the antennal funicle beyond the first joint brownish yellow or dusky, the solid club black; remaining portion of the legs concolorous with the abdomen. Abdominal petiole pallid yellow. Wings perfectly clear, transparent.

Differs from the preceding species in having narrower fore wings which bear finer and shorter discal ciliation (16 lines), the ciliation disappearing proximad and not dense; the color of the appendages is duller, the antennal joints are shorter, the second joint for instance distinctly not twice the length of the pedicel, the first joint, however, lengthened so as to be longer than the pedicel or subequal to it and at least two thirds the length of the second and longest funicle joint. Thus, in relation to the second joint, the first appears to be lengthened as in *psceas* but in reality it is no longer than the same joint in *consobrinus*. The longest marginal cilia of the fore wing (disto-caudad) are about two thirds or not quite, the greatest width of those wings. The cilia are longer cephalo-distad and caudo-distad than at the apex. Posterior wings narrow, their caudal marginal cilia nearly as long as the longest marginal cilia of the fore wings; they bear 2 lines of discal cilia, one along each margin, the cilia in each line not close together; apparently neither line is paired. Fore wings in discal ciliation doubtless resembling somewhat the North American *piceipes* Girault.

Antennae normal for the genus, none of the nine joints long; first funicle joint somewhat lengthened for the genus; second funicle joint longest of the funicle, one and a half times longer than the pedicel, only slightly longer than the third, which is distinctly longer than the first; funicle widening after joint 3; joint 4 short, oval, slightly shorter than 1, joint 5 only slightly shorter than 4; the distal funicle joint still very slightly shorter and broader, the shortest joint. The club large but not long.

(From one specimen, the same magnification.)

Male:—Not known.

Described from a single female specimen captured at Cooktown, N.Q., February 3, 1912 from the panes of a window in an unoccupied dwelling. Respectfully dedicated to Herbert Spencer, great philosopher and forceful exponent of reason as based on experience.

Habitat: Australia—Queensland (Cooktown).

Type: No. Hy/1070, Queensland Museum, Brisbane, the above specimen in xylol-balsam (mounted with specimens of *Trichogramma*, type *Paratrichogramma* and *Oligosita*).

3. POLYNEMA DRAPERI new species.

Male:—Length, 0.70 mm.; moderately small for the genus.

Black, the antennal scape and pedicel, the abdominal petiole and the legs excepting distal tarsal joints and the intermediate and caudal femora and tibiae (which are suffused with dusky) pale orange yellow. Wings uniformly subhyaline.

Somewhat like the North American species *longipes* (Ashmead), the fore wings narrow, with only about from eleven to twelve lines of discal ciliation across the widest portion of the blade, the longest marginal cilia about a fourth longer than the greatest width. Though of the general type of *longipes*, the fore wings are much broader than in that species, their discal ciliation fine, shorter and more dense. But they are shaped in general like those of *longipes*, being elliptical and obtusely pointed at apex, shaped somewhat like a torpedo. Caudal wings very narrow. Parapsidal furrows complete. Proximal tarsal joints long and slender, subequal to the next two joints combined or slightly longer. Antennae 13-jointed, normal, longitudinally striated on the funicle, the first funicle joint about twice the length of the pedicel, the joints shortening distad; funicle joints 1-4 subequal, long and slender, a third or fourth longer than the club joint which is long-elliptical and four times longer than its greatest width; funicles 5-6 slightly shorter than 4; 7-10 subequal and shorter, 10 only slightly longer than the club joint.

(From one specimen, the same magnification.)

Female:—Not known.

Described from a single male specimen captured by sweeping grass in a field near Cooktown, N.Q., February 27, 1912. Captured with specimens of the trichogrammatid *Tumidiclava ciliata* Girault. Dedicated to John William Draper, the physiologist, who has shown so clearly that civilisations, societies and all human populations are as immutably ruled by natural law as is the development of the individual human or the evolution of a species of bird or plant. The works of this man are neglected by nations at their peril.

Habitat: Australia—Cooktown and Thursday Island, Queensland.

Type: No. Hy/1069, Queensland Museum, Brisbane, the above male in xylol-balsam (mounted with five females of *Tumidiclava ciliata* Girault).

Subsequently, another male was captured by sweeping grass on Thursday Island, Torres Strait, March 13, 1912. This had the antennal and proximal tarsal joints all somewhat relatively longer and more slender. Later still a third male was found which had been captured from the pane of a window in an unoccupied dwelling at Cooktown, January 31, 1912.

4. *POLYNEMA SIEBOLDI* new species.

The two specimens of this species were first taken to be *albicoxa* Ashmead, whose original description is not now available to me so that I am not sure that they are correctly identified. The species agrees with the Ashmeadean species; it bears the single fascia across the fore wings, the coxæ and trochanters are white, the rest of the legs lemon-yellow while the funicle distad of the proximal joint is very pale brownish, the club black, the distal funicle joint darker than the others. The distal tarsal joint is dusky; the first three joints of the antennæ are lemon-yellow, while the abdominal petiole is whitish. The band across the fore wing is subquadrate, somewhat over its own length from the marginal vein, a third nearer to the latter than to the wing apex. The scape is not sculptured or asperate; the first funicle joint is longer than the pedicel and at least thrice longer than wide, half the length of the long second joint and subequal in length to the fourth funicle joint; the third funicle joint is slightly shorter than the second and widened slightly distad. The proximal tarsal joint is very long and slender, nearly as long as the combined lengths of the other three joints. The discal cilia of the fore wing are moderately fine, arranged in about eighteen lines while the longest marginal cilia are about two thirds the greatest width of the wing. The posterior wings are dusky throughout. The ovipositor is only slightly exerted. But I must consider it distinct for the reasons given beyond.

The foregoing notes are based on a single female captured by sweeping in a jungle near canefields at Goondi (Innisfail), N.Q., July 24, 1912. Girault (1911a) records a male from Fiji but both that record and this Australian one must be under suspicion until the species *albicoxa* is better known, since I believe it was described from the West Indies.

While at first concluding that the above specimen is the same as the Fiji male identified as *albicoxa*, subsequently I found a male captured also in the jungle at Goondi, several days later. This male differs from the description of the Fiji specimen in having decidedly shorter antennal joints and this fact makes me conclude that the Australian form is a distinct species, differing colorationally in some character which cannot be made out from the descriptions. Since *albicoxa* was described, I believe, from the West Indies, the Fiji specimen is also probably distinct but for the present I leave it as identified by me in 1911. There are thus probably three species of *Polynema* bearing one-banded fore wings.

The male *sieboldi* has the antennal funicle and club black, the first funicle joint, however, whitish, the scape and pedicel lemon-yellow like the legs; the coxæ are yellow; knees of the caudal legs fuscous. The funicle joints are not quite thrice longer than wide, the somewhat shorter proximal joint of the funicle about twice the length of the spherical pedicel which is somewhat wider than long. The species is moderately small for the genus, measuring about 0.65 mm.

(From a single specimen of each sex, the same magnification.)

Habitat: Australia—Queensland (Goondi, Innisfail District).

Types: No. Hy/1073, Queensland Museum, Brisbane, the foregoing specimens, two slides (the ♀ mounted with the male type of *Polynema romanesi* Girault).

Polynema sieboldi is dedicated to Carl Theodore Siebold who discovered single-celled organisms.

5. POLYNEMA ROMANESI new species.

Male:—Length, 1.00 mm.

Black, the scape and pedicel of the antenna, the legs and abdominal petiole orange-yellow; distal tarsal joint black; funicle wholly black; marginal vein brownish black, the fore wings indistinctly, somewhat irregularly lightly stained. Coxæ lightly tinged with fuscous.

Different from all the preceding species but most similar to *draperi* from which it differs in having broader fore wings, longer legs and antennal joints and more intense yellow coloration. The fore wings bear about sixteen lines of moderately fine discal ciliation; the marginal cilia of the fore wing are about as long as three fourths of the greatest wing width. The fore wings are moderately slender. The longest antennal joints, joints 2-5 of the funicle, are each fully six times their greatest width. Posterior wings very narrow. Pedicel obconic.

(From one specimen, the same magnification.)

Female:—Not known.

Described from a single male specimen taken alive from a spider's web suspended between cane-plants along the edge of a canefield in jungle country, Darradgee, N.Q., July 26, 1912. Named after G. J. Romanes, one of the pioneers of animal psychology.

Habitat: Australia—Darradgee, Innisfail District, Queensland.

Type: No. Hy/1074, Queensland Museum, Brisbane, the forenoted male (mounted with the female type of *P. sieboldi*).

LITERATURE REFERRED TO.

1887. Ashmead, William Harris, *Canadian Entomologist*, London, Ontario, XIX.
1905. Perkins, R.C.L., Bull. No. 1, part 6, Hawaiian Sugar Planters' Association, Honolulu
1906. Idem. *Ib.*, introduction.
1910. Idem. *Fauna Hawaiiensis*, Cambridge, England, II, pt. VI.
1911 a. Girault, Alexandre Arsène. *Archiv. f. Naturgeschichte*, Berlin.
1911 b. Idem, *Entomological News*, Philadelphia, XXII.
1911 c. Idem, *Transactions American Entomological Society*, Philadelphia, XXVII.
1911 d. Idem, *Proceedings Entomological Society of Washington (U.S.A.)*, XIII.
1912. Idem. *Ib.*, XIV.
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